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=> file reg
FILE 'REGISTRY' ENTERED AT 16:59:03 ON 17 OCT 2003
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=> display history full l1-


     FILE 'REGISTRY' ENTERED AT 14:32:38 ON 17 OCT 2003
L1          2249 SEA (LI(L)NB(L)O)/ELS
L2           269 SEA L1 (L) (MG OR IN OR ZN)/ELS
L3            80 SEA L1 (L) FE/ELS
L4            10 SEA L2 AND L3
L5             1 SEA L4 AND 5/ELC.SUB

     FILE 'HCA' ENTERED AT 14:37:15 ON 17 OCT 2003
L6             1 SEA L5
L7             8 SEA L4
L8        327148 SEA DOPE# OR DOPING# OR DOPANT? OR INTERCAL?
L9             0 SEA L7 AND L8

     FILE 'REGISTRY' ENTERED AT 14:37:55 ON 17 OCT 2003
                 E DILITHIUM CARBONATE/CN
L10            1 SEA "DILITHIUM CARBONATE"/CN
                 E DINIOBIUM PENTOXIDE/CN
L11            1 SEA "DINIOBIUM PENTOXIDE"/CN
                 E FERRIC OXIDE/CN
L12            1 SEA "FERRIC OXIDE"/CN
                 E DIINDIUM TRIOXIDE/CN
L13            1 SEA "DIINDIUM TRIOXIDE"/CN
                 E ZINC MONOXIDE/CN
L14            1 SEA "ZINC MONOXIDE"/CN

     FILE 'HCA' ENTERED AT 14:43:28 ON 17 OCT 2003
L15        11369 SEA L10 OR (LITHIUM# OR DILITHIUM# OR LI)(W)CARBONATE#
                 OR LI2CO3
L16        15771 SEA L11 OR (NIOBIUM# OR DINIOBIUM# OR NB)(W)(PENTOXIDE#
                 OR PENTAOXIDE#) OR NB2O5
L17       168073 SEA L12 OR (IRON# OR FERRIC# OR FE)(W)(OXIDE# OR
                 TRIOXIDE#) OR FE2O3

     FILE 'REGISTRY' ENTERED AT 14:43:43 ON 17 OCT 2003
                 E MAGNESIUM OXIDE/CN
L18            1 SEA "MAGNESIUM OXIDE"/CN

     FILE 'HCA' ENTERED AT 14:45:32 ON 17 OCT 2003
L19       165094 SEA L18 OR (MAGNESIUM# OR MG)(W)(OXIDE# OR MONOXIDE#) OR
                 MGO
L20        11881 SEA L13 OR (INDIUM# OR DIINDIUM#)(W)(OXIDE# OR TRIOXIDE#)
                  OR IN2O3
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L21       116052 SEA L14 OR (ZINC# OR ZN)(W)(OXIDE# OR MONOXIDE#) OR ZNO
L22           23 SEA L15 AND L16 AND L17 AND (L19 OR L20 OR L21)
L23           10 SEA L22 AND L8

     FILE 'REGISTRY' ENTERED AT 14:53:33 ON 17 OCT 2003
L24          132 SEA L1 (L) 3/ELC.SUB

     FILE 'HCA' ENTERED AT 14:55:16 ON 17 OCT 2003
L25        15248 SEA L24 OR LINBO3 OR LINB!O3 OR LI!NBO3 OR LI!NB!O3 OR
                 LI(W)NB(W)O3
L26        45650 SEA FEMG OR FEIN OR FEZN OR MGFE OR INFE OR ZNFE OR
                 (IRON# OR FE)(A)(MAGNESIUM# OR MG OR INDIUM# OR ZINC# OR
                 ZN)
L27           78 SEA L25 AND L26
L28           63 SEA L27 AND L8
L29          104 SEA L26(2A)L8
L30           27 SEA L25 AND L29
L31           25 SEA L28 AND (L19 OR L20 OR L21)
L32            5 SEA L28 AND L15 AND L16 AND L17
L33          417 SEA FEMG OR FEIN OR FEZN OR MGFE OR INFE OR ZNFE
L34        12872 SEA LINBO3 OR LINB!O3 OR LI!NBO3 OR LI!NB!O3 OR LI(W)NB(W
                 )O3
L35            0 SEA L34(2A)L33
L36           44 SEA L25(2A)L26
L37           42 SEA L36 AND L8
L38           42 SEA L28 AND L37
L39         5106 SEA (DOUBL? OR DUPLE? OR TWIN? OR DYAD? OR PAIR? OR
                 TWO?)(2A)(DOPE# OR DOPING# OR DOPANT? OR INTERCAL?)
L40          144 SEA L25 AND L39
L41           30 SEA L40 AND (L19 OR L20 OR L21)
L42           11 SEA L40 AND L26
L43           11 SEA L40 AND L28
L44            6 SEA L41 AND L17
L45            2 SEA L41 AND L16
L46            2 SEA L41 AND L15
L47            3 SEA L39 AND L15 AND L16 AND L17
L48            2 SEA L22 AND L39
L49            4 SEA L31 AND L39
L50         2297 SEA DOUBL?(2A)(DOPE# OR DOPING# OR DOPANT? OR INTERCAL?)
L51            2 SEA L50 AND L22
L52           11 SEA L50 AND L25 AND L26
L53            6 SEA L50 AND L25 AND L17 AND (L19 OR L20 OR L21)
L54           11 SEA L6 OR L32 OR L44 OR L45 OR L46 OR L47 OR L48 OR L49
                 OR L51 OR L53
L55           12 SEA (L23 OR L42 OR L43 OR L52) NOT L54
L56           56 SEA (L30 OR L31 OR L41) NOT (L54 OR L55)
L57           12 SEA L37 NOT (L54 OR L55 OR L56)
L58           13 SEA L22 NOT (L54 OR L55 OR L56 OR L57)
L59        15236 SEA CZOCHRALSKI#
L60            9 SEA L56 AND L59
L61            3 SEA L57 AND L59
L62            0 SEA L58 AND L59
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L63            12 SEA (L60 OR L61) NOT (L54 OR L55)
L64            47 SEA L56 NOT (L54 OR L55 OR L63)
L65             9 SEA L57 NOT (L54 OR L55 OR L63 OR L64)
L66            13 SEA L58 NOT (L54 OR L55 OR L63 OR L64 OR L65)
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=> file hca
FILE 'HCA' ENTERED AT 17:00:11 ON 17 OCT 2003
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=> d l54 1-11 cbib abs hitstr hitind

L54 ANSWER 1 OF 11 HCA COPYRIGHT 2003 ACS on STN
139:237587 Growth and holographic storage properties of **Mg**:**Fe**:LiTaO3 crystal. Zhao, Yequan; Fang, Shuangquan; Xu, Wusheng; Xu, Yuheng (Dept. of Astronautic Engineering and Mechanics, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 5060(Optical Storage), 231-234 (English) 2003. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB **Mg**:**Fe**:LiTaO3 crystals were first grown by Czochralski method, and Fe:LiTaO3 crystals, Fe:**LiNbO3** and **Mg**:**Fe**:**LiNbO3** crystals were also grown at the same time. The holog. storage properties of these crystals, such as the exponential gain coeff., the diffraction efficiency and the response time, were measured by the two-wave coupling method. It was found that the response speed of **Mg**:**Fe**:LiTaO3 crystal was five times faster than that of Fe:LiTaO3. The light scattering resistance ability was also measured, and that of **Mg**:**Fe**:LiTaO3 crystal was two orders of magnitude higher than that of Fe:LiTaO3 as well as higher than that of **Mg**:**Fe**:**LiNbO3**. The enhancement mechanism of the photorefractive properties for **Mg**:**Fe**:LiTaO3 crystal was discussed for the first time.

IT **1309-37-1**, **Iron trioxide**, properties
(LiTaO3 and **LiNbO3** **doped** with; growth of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg for holog.)

RN 1309-37-1 HCA

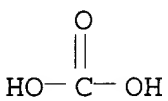
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(**doped** with Mg and Fe; growth and holog. storage and light scattering resistance and photorefractive properties of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **554-13-2, Lithium carbonat**
1313-96-8, Niobium pentoxide
(precursor; growth of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg for holog.)
RN 554-13-2 HCA
CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

RN 1313-96-8 HCA
CN Niobium oxide (Nb2O5) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST holog storage lithium tantalate niobate **magnesium iron dopant**; photorefractive property lithium tantalate **magnesium iron dopant**; light scattering resistance lithium tantalate **magnesium iron dopant**
IT Holographic memory devices
Holographic recording materials
Holography
Light scattering
Photorefractive effect
Photorefractive materials
(growth and holog. storage and light scattering resistance and photorefractive properties of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg)
IT Czochralski crystal growth
Doping
Optical gain
(growth of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg for holog.)
IT Nonlinear optical properties
(two-beam coupling; growth and holog. storage and light scattering resistance and photorefractive properties of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg)
IT **1309-37-1, Iron trioxide**, properties
1309-48-4, Magnesium oxide, properties
(LiTaO3 and **LiNbO3** **doped** with; growth of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg for holog.)

IT **12031-63-9**, Lithium niobate (**LiNbO3**) 12031-66-2,
Lithium tantalate(LiTaO3)
(**doped** with Mg and Fe; growth and holog. storage and light scattering resistance and photorefractive properties of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg)

IT **554-13-2, Lithium carbonate**
1313-96-8, Niobium pentoxide
1314-61-0, Tantalum pentoxide
(precursor; growth of LiTaO3 and **LiNbO3** crystals **doped** with Fe and Mg for holog.)

L54 ANSWER 2 OF 11 HCA COPYRIGHT 2003 ACS on STN
139:140107 Structure and properties of **Zn**:**Fe**: **LiNbO3** crystals. Zhen, Hihe; Li, Meicheng; Liu, Caixia; Zhao, Liancheng; Xu, Yuheng (School of Material Science and Engineering, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 5060(Optical Storage), 203-206 (English) 2003. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB **Zn, Fe double-doped** **LiNbO3** crystals were grown by Czochralski technique with 0.015% of **Fe2O3** and with different concn. of **ZnO** . The defect structures of the **Zn**:**Fe**: **LiNbO3** crystals were studied by x-ray diffraction analyses and IR absorption spectra. The lattice consts. of the **Zn**: **Fe**:**LiNbO3** increase with the concn. of **ZnO** increasing in the crystals. The absorption peaks of the IR transmission spectra shift to the shorter wavelength with the increasing of concn. of **ZnO**. The optical damage resistance ability of the **Zn**:**Fe**:**LiNbO3** crystals were studied by straightly observing transmission facula distortion method, resp. Compared with of Fe:**LiNbO3**, the optical damage resistance ability of the Zn (7.0 mol%):Fe: **LiNbO3** crystals is two orders magnitude higher than that of **LiNbO3** crystal. 6.0 mol% of **ZnO** is the perfect **doping** concn.

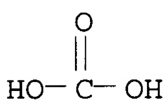
IT **1309-37-1, Iron oxide Fe2O3**,
uses **1314-13-2**, **Zinc oxide**, uses
(**dopant** source; structure and properties of **Zn** :**Fe**:**LiNbO3** crystals)

RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)

O═Zn

IT **12031-63-9**, Lithium niobate **LiNbO3**

(**doped** with iron and zinc; structure and properties of
Zn:**Fe**:**LiNbO3** crystals)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **554-13-2**, **Lithium carbonate**
1313-96-8, **Niobium pentoxide**
(structure and properties of **Zn**:**Fe**:
LiNbO3 crystals)
RN 554-13-2 HCA
CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

RN 1313-96-8 HCA
CN Niobium oxide (Nb2O5) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 75
ST structure property **zinc iron doped**
lithium niobate crystal
IT Crystal structure
IR spectra
X-ray diffraction
(structure and properties of **Zn**:**Fe**:
LiNbO3 crystals)
IT 7439-89-6, Iron, properties 7440-66-6, Zinc, properties
(**LiNbO3 doped** with; structure and properties
of **Zn**:**Fe**:**LiNbO3** crystals)
IT **1309-37-1**, **Iron oxide Fe2O3**,
uses **1314-13-2**, **Zinc oxide**, uses
(**dopant** source; structure and properties of **Zn**
:**Fe**:**LiNbO3** crystals)
IT **12031-63-9**, Lithium niobate **LiNbO3**
(**doped** with iron and zinc; structure and properties of
Zn:**Fe**:**LiNbO3** crystals)
IT **554-13-2**, **Lithium carbonate**
1313-96-8, **Niobium pentoxide**
(structure and properties of **Zn**:**Fe**:
LiNbO3 crystals)

L54 ANSWER 3 OF 11 HCA COPYRIGHT 2003 ACS on STN
137:330549 Ion-irradiation influence on optical absorption spectra of

MgO:LiNbO3 and **MgO+Fe2O3**:
LiNbO3 single crystals. Kim, Ill Won; Park, Bong Chan; Jin, Byung Mun; Jeong, Jung Hyun; Lee, Kwang-Sei (Department of Physics, University of Ulsan, Ulsan, 680-749, S. Korea). Ferroelectrics, 269, 243-248 (English) 2002. CODEN: FEROA8. ISSN: 0015-0193. Publisher: Taylor & Francis Ltd..

AB An optical absorption spectra of the **LiNbO3** (LN), **MgO doped LiNbO3** (MLN), and **Mg +Fe doubly doped LiNbO3** (FMLN) crystals before and after an Ar+ ion irradn. were measured from the UV to the visible range. The absorption edges of the MLN crystals, which are induced by an Ar+ ion irradn., are shifted to the realm of a short wavelength with increasing **MgO** concn. However, the absorption edges of the FMLN crystals before and after an Ar+ ion irradn. are displaced to the realm of the long wavelength with increasing **Fe2O3** concn. The absorption band that is originated from the ionization of Fe3+ is obsd. at 2.58 eV.

IT **1309-37-1**, **Iron oxide** (**Fe2O3**), properties **1309-48-4**, **Magnesium oxide** (**MgO**), properties
(ion-irradn. influence on optical absorption spectra of **MgO:LiNbO3** and **MgO+Fe2O3**: **LiNbO3** single crystals)

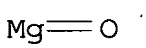
RN 1309-37-1 HCA

CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(ion-irradn. influence on optical absorption spectra of **MgO:LiNbO3** and **MgO+Fe2O3**: **LiNbO3** single crystals)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-4 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75

IT Crystal defects
(antisite; ion-irradn. influence on optical absorption spectra of **MgO:LiNbO3** and **MgO+Fe2O3**: **LiNbO3** single crystals)

IT Ion bombardment
Optical absorption edge
UV and visible spectra
(ion-irradn. influence on optical absorption spectra of **MgO:LiNbO3** and **MgO+Fe2O3**: **LiNbO3** single crystals)

IT **1309-37-1**, **Iron oxide** (**Fe2O3**), properties **1309-48-4**, **Magnesium oxide** (**MgO**), properties
(ion-irradn. influence on optical absorption spectra of **MgO**:**LiNbO3** and **MgO**+**Fe2O3**: **LiNbO3** single crystals)

IT 14791-69-6, Argon 1+, uses
(ion-irradn. influence on optical absorption spectra of **MgO**:**LiNbO3** and **MgO**+**Fe2O3**: **LiNbO3** single crystals)

IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(ion-irradn. influence on optical absorption spectra of **MgO**:**LiNbO3** and **MgO**+**Fe2O3**: **LiNbO3** single crystals)

L54 ANSWER 4 OF 11 HCA COPYRIGHT 2003 ACS on STN

136:158746 Enhancement of non-volatile recording by an external field in **doubly doped** lithium niobate. Fujimura, R.; Ashihara, S.; Matoba, O.; Shimura, T.; Kuroda, K. (Institute of Industrial Science, University of Tokyo, Tokyo, 153-8505, Japan). Trends in Optics and Photonics, 62(Photorefractive Effects, Materials, and Devices), 212-217 (English) 2001. CODEN: TOPRBS. Publisher: Optical Society of America.

AB The authors propose a novel technique to enhance a non-volatile photorefractive grating in a two-color holog. recording. Resultant diffraction efficiency is increased by an applied external elec. field in the fixing process. The influence of the external elec. field is investigated both exptl. and theor. In an iron and manganese co-doped lithium niobate crystal, resultant diffraction efficiency was enhanced from 0.4% to 1.7% when a 10 kV/cm elec. field was applied anti-parallel to the +c-axis.

IT **1309-37-1**, **Iron oxide**(**Fe2O3**), processes **1309-48-4**, **Magnesium oxide** (**MgO**), processes
(enhancement of non-volatile photorefractive grating in two-color holog. recording in **doubly doped** lithium niobate)

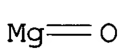
RN 1309-37-1 HCA

CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate **LiNbO3**
(enhancement of non-volatile photorefractive grating in two-color holog. recording in **doubly doped** lithium niobate)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST nonvolatile holog recording external field **doubly doped** lithium niobate; photorefractive grating nonvolatile holog recording **doubly doped** lithium niobate
IT Electric field effects
Holography
(enhancement of non-volatile photorefractive grating in two-color holog. recording in **doubly doped** lithium niobate)
IT Holographic memory devices
(enhancement of non-volatile photorefractive grating in two-color holog. recording in **doubly doped** lithium niobate in relation to)
IT **1309-37-1**, **Iron oxide**(Fe_2O_3), processes **1309-48-4**, **Magnesium oxide** (**MgO**), processes
(enhancement of non-volatile photorefractive grating in two-color holog. recording in **doubly doped** lithium niobate)
IT **12031-63-9**, Lithium niobate **$LiNbO_3$**
(enhancement of non-volatile photorefractive grating in two-color holog. recording in **doubly doped** lithium niobate)

L54 ANSWER 5 OF 11 HCA COPYRIGHT 2003 ACS on STN
135:114392 Experimental study of non-volatile holographic storage of **doubly**- and triply-**doped** lithium niobate crystals.
Liu, You-wen; Liu, Li-ren; Zhou, Chang-he; Xu, Liang-ying (Shanghai Institute of Optics and Fine Mechanics, The Chinese Academy of Sciences, Shanghai, 201800, Peop. Rep. China). Zhongguo Jiguang, A28(2), 165-168 (Chinese) 2001. CODEN: ZHJIDO. ISSN: 0258-7025. Publisher: Kexue Chubanshe.
AB Four lithium niobate crystals **doped** with Cu:Ce, Mn:Cu:Ce, Mn:Fe, and Mn:**Fe**:**Mg**, which are processed under two different oxidn./redn. conditions, have been studied exptl. for non-volatile holog. storage with UV and red light. The non-volatile holog. storage in **$LiNbO_3$**:Cu:Ce and **$LiNbO_3$**:Cu:Ce:Mn crystals is realized. The results show that higher oxidized crystals may realize non-volatile holog. storage. The persistent diffraction efficiency of non-volatile holog. storage of **$LiNbO_3$**:Cu:Ce crystal is the largest on the premise of high signal-to-noise.
IT **12031-63-9**, Lithium niobate
(Non-volatile holog. storage of **doubly**- and triply-**doped** lithium niobate crystals)
RN 12031-63-9 HCA
CN Lithium niobium oxide ($LiNbO_3$) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **1309-37-1**, **Iron oxide** (Fe_2O_3), uses **1309-48-4**, **Magnesium oxide** (

MgO), uses
(**dopant**; Non-volatile holog. storage of **doubly** - and triply-**doped** lithium niobate crystals)

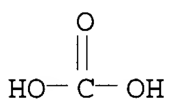
RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST holog grating metal **dopant** lithium niobate; nonvolatile holog storage
IT **Dopants**
Holographic diffraction gratings
Holographic memory devices
(Non-volatile holog. storage of **doubly**- and triply-**doped** lithium niobate crystals)
IT **12031-63-9**, Lithium niobate
(Non-volatile holog. storage of **doubly**- and triply-**doped** lithium niobate crystals)
IT **1309-37-1**, **Iron oxide** (**Fe2O3**), uses **1309-48-4**, **Magnesium oxide** (**MgO**), uses 1317-38-0, Copper oxide (CuO), uses 1344-43-0, Manganese oxide (MnO), uses 1345-13-7, Cerium oxide (Ce2O3)
(**dopant**; Non-volatile holog. storage of **doubly** - and triply-**doped** lithium niobate crystals)

L54 ANSWER 6 OF 11 HCA COPYRIGHT 2003 ACS on STN
134:11390 Study of holographic interferometry for **Zn**:**Fe**:**LiNbO3** crystal. Zhao, Yequan; Wang, Rui; Xu, Wusheng; Wang, Jiyang (Dept. of Space Engineering and Mechanics, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Gaojishu Tongxun, 10(6), 71-72, 83 (Chinese) 2000. CODEN: GTONE8. ISSN: 1002-0470. Publisher: Gaojishu Tongxun Zazhishe.
AB The holog. interferometry for **Zn**:**Fe**:**LiNbO3** crystal was studied. **Zn**:**Fe**:**LiNbO3** crystal was prepd. by Czochralski method. Twin exposure real-time interferometry was obtained with **Zn**:**Fe**:**LiNbO3** crystal as record medium and Cu:KNSBN crystal as self-pumped phase conjugation mirror. The light scattering resistance and response time of **Zn**:**Fe**:**LiNbO3** crystal were superior to that of Fe:**LiNbO3** crystal. The results showed that the holog. interferometry may be used in nondestructive measurement system with high precision and low error.
IT **12031-63-9P**, Lithium niobate
(study of holog. interferometry for **Zn**:**Fe**:

LiNbO3 crystal)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **554-13-2**, **Lithium carbonate**
1309-37-1, **Ferric oxide**, reactions
1313-96-8, Niobium oxide
(study of holog. interferometry for **Zn**:**Fe**:
LiNbO3 crystal)
RN 554-13-2 HCA
CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1313-96-8 HCA
CN Niobium oxide (Nb2O5) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 75
IT Czochralski crystal growth
Holographic interferometry
Holographic memory devices
Light scattering
(study of holog. interferometry for **Zn**:**Fe**:
LiNbO3 crystal)
IT 7439-89-6, Iron, uses 7440-66-6, Zinc, uses
(**dopant**; study of holog. interferometry for **Zn**
:**Fe**:**LiNbO3** crystal)
IT **12031-63-9P**, Lithium niobate
(study of holog. interferometry for **Zn**:**Fe**:
LiNbO3 crystal)
IT **554-13-2**, **Lithium carbonate**
1309-37-1, **Ferric oxide**, reactions
1313-96-8, Niobium oxide 1314-13-2, Zinc oxide, reactions
(study of holog. interferometry for **Zn**:**Fe**:
LiNbO3 crystal)

L54 ANSWER 7 OF 11 HCA COPYRIGHT 2003 ACS on STN
132:286222 Localized holographic recording in **doubly**
doped lithium niobate. Moser, Christophe; Schupp, Benjamin;

Psaltis, Demetri (Department of Electrical Engineering, California Institute of Technology, Pasadena, CA, 91125, USA). Optics Letters, 25(3), 162-164 (English) 2000. CODEN: OPLEDP. ISSN: 0146-9592. Publisher: Optical Society of America.

AB Persistent holograms are recorded locally with red light in a **LiNbO3** crystal doped with Mg and Fe. Selective erasure is realized by use of a focused UV sensitizing light. The authors demonstrate the recording of 50 localized images as well as selective erasure in a 4 mm .times. 4 mm .times. 4 mm crystal. A comparison of the total recording time for M holograms obtained with the conventional distributed-vol. recording and the localized methods is presented.

IT **1309-37-1**, **Iron oxide**(**Fe2O3**), uses **1309-48-4**, **Magnesium oxide**(**MgO**), uses
(localized holog. recording in **doubly doped** lithium niobate)

RN 1309-37-1 HCA

CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(localized holog. recording in **doubly doped** lithium niobate)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST holog recording **doubly doped** lithium niobate

IT Holographic recording materials
(localized holog. recording in **doubly doped** lithium niobate)

IT **1309-37-1**, **Iron oxide**(**Fe2O3**), uses **1309-48-4**, **Magnesium oxide**(**MgO**), uses
(localized holog. recording in **doubly doped** lithium niobate)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(localized holog. recording in **doubly doped** lithium niobate)

L54 ANSWER 8 OF 11 HCA COPYRIGHT 2003 ACS on STN

132:257792 Studies of photorefractive crystals of **double-doped** Ce,Fe:LiNbO3. Xu, Shiwen; Zhao, Yequan; Li, Minghua; Xu, Yuheng; Yang, Chunhui; Rui, Wang (Department of Applied Chemistry, Harbin Institute of Technology, Harbin, 150001, Peop.

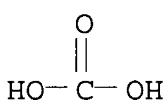
Rep. China). High Technology Letters, 6(1), 54-58 (English) 2000.
CODEN: HTLEFC. ISSN: 1006-6748. Publisher: Editorial Department of
High Technology Letters.

AB Photorefractive crystals of Ce, Fe:LiNbO3 are systematically
studied. The crystals were grown by Czochralski method. The
samples with different doping concns. and oxidn./redn. treatments
were fabricated. Their photorefractive properties were exptl.
studied by using two-beam coupling. The photorefractive efficiency
depends on the dopant concn., oxidn./redn. treatment, and light
wavelength. The doping mechanism is also discussed here.

IT **554-13-2, Lithium carbonate**
1309-37-1, Iron sesquioxide, reactions **1313-96-8**,
Niobium oxide
(photorefractive crystals of **double-doped**
Ce,Fe:LiNbO3)

RN 554-13-2 HCA

CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

RN 1309-37-1 HCA

CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 1313-96-8 HCA

CN Niobium oxide (Nb2O5) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 75

IT Nonlinear optical properties
(beam coupling; photorefractive crystals of **double-doped** Ce,Fe:LiNbO3)

IT Czochralski crystal growth
Photorefractive effect
Photorefractive materials
UV and visible spectra
(photorefractive crystals of **double-doped**
Ce,Fe:LiNbO3)

IT Oxidation
Reduction
(treatment; photorefractive crystals of **double-doped** Ce,Fe:LiNbO3)

IT 7439-89-6, Iron, properties 7440-45-1, Cerium, properties
(photorefractive crystals of **double-doped**

Ce,Fe:LiNbO3)

IT 12031-63-9P, Lithium niobate LiNbO3
(photorefractive crystals of **double-doped**
Ce,Fe:LiNbO3)

IT **554-13-2, Lithium carbonate** 1306-38-3,
Cerium dioxide, reactions **1309-37-1**, Iron sesquioxide,
reactions **1313-96-8**, Niobium oxide
(photorefractive crystals of **double-doped**
Ce,Fe:LiNbO3)

L54 ANSWER 9 OF 11 HCA COPYRIGHT 2003 ACS on STN

131:136909 Growth of **double doped LiNbO3**
crystals and study of real- time image differential. Xu, Yanling; Liu, Xinrong; Xu, Wusheng; Xu, Yuheng; Wang, Jiyang (Department of Applied Chemistry, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Gaojishu Tongxun, 9(4), 34-37 (Chinese) 1999. CODEN: GTONE8. ISSN: 1002-0470. Publisher: Gaojishu Tongxun Zazhishe.

AB **Double-doped** crystals of **Zn:Fe:LiNbO3** and Ce:Nd:**LiNbO3** were prepd. by Czochralski method. **Zn:Fe:LiNbO3** crystal was made from **Li2CO3**, **Nb2O5**, 6 mol% **ZnO**, and 0.03 mol% FeLi2CO32O3. Ce:Nd:**LiNbO3** crystal was made from **Li2CO3**, **Nb2O5**, 0.1% CeO2, and 0.1% Nd2O3. Molar ratio of **Li2CO3** and **Nb2O5** was 48.6:51.4. Light resistance, diffraction efficiency, and response time of the crystals were measured. The real-time image differential tests were carried out by using **double-doped LiNbO3** crystals (pretreated by redn.) as holog. record materials and Ce:Cu:KNSBN crystal as phase conjugation mirror. The definition of image treatment using **Zn:Fe:LiNbO3** was better than that of image treatment using Ce:Nd:**LiNbO3**.

IT **12031-63-9P**, Lithium niobate (**LiNbO3**)
(growth of **LiNbO3** crystals **double doped** with **zinc**, **iron**, cerium and neodymium)

RN 12031-63-9 HCA

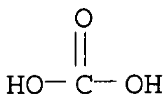
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT **554-13-2, Lithium carbonate (Li2CO3) 1309-37-1, Ferric oxide**
, reactions **1313-96-8**, Niobium oxide (**Nb2O5**)
1314-13-2, Zinc oxide (ZnO),
reactions
(growth of **LiNbO3** crystals **double doped** with **zinc**, **iron**, cerium and neodymium)

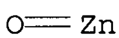
RN 554-13-2 HCA

CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1313-96-8 HCA
CN Niobium oxide (Nb2O5) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)



CC 75-1 (Crystallography and Liquid Crystals)
ST crystal growth **doped** lithium niobate crystal; iron **doped** lithium niobate crystal growth; zinc **doped** lithium niobate crystal growth; cerium **doped** lithium niobate crystal growth; neodymium **doped** lithium niobate crystal growth
IT Crystal growth
Crystal morphology
(growth of **LiNbO3** crystals **double doped** with **zinc**, **iron**, cerium and neodymium)
IT 7439-89-6, Iron, uses 7440-00-8, Neodymium, uses 7440-45-1, Cerium, uses 7440-66-6, Zinc, uses
(growth of **LiNbO3** crystals **double doped** with **zinc**, **iron**, cerium and neodymium)
IT **12031-63-9P**, Lithium niobate (**LiNbO3**)
(growth of **LiNbO3** crystals **double doped** with **zinc**, **iron**, cerium and neodymium)
IT **554-13-2**, **Lithium carbonate** (**Li2CO3**) **1309-37-1**, **Ferric oxide**, reactions **1313-96-8**, Niobium oxide (**Nb2O5**) **1314-13-2**, **Zinc oxide** (**ZnO**), reactions
(growth of **LiNbO3** crystals **double doped** with **zinc**, **iron**, cerium and neodymium)

L54 ANSWER 10 OF 11 HCA COPYRIGHT 2003 ACS on STN
120:40714 Studies on the spectral properties of magnesium- and iron-**doped** lithium niobate (**LiNbO3**) crystal. Li, Minghua; Zhao, Yequan; Xu, Yuheng; Liu, Caixia; Shi, Dongqi; Wu, Zhongkang (Dep. Appl. Chem., Harbin Univ. Technol., Harbin, 150006, Peop. Rep. China). Gaodeng Xuexiao Huaxue Xuebao, 14(6), 860-2 (Chinese) 1993. CODEN: KTHPDM. ISSN: 0251-0790.

AB The **Mg:Fe:LiNbO3** crystal samples were prepd. by a melt-pulling method. One sample was reduced in **Li2CO3** powders at 500.degree. for 24 h, and another sample was oxidized in **Nb2O5** powders at 1000.degree. for 20 h. The contents of MgO and **Fe2O3** were 5 and 0.08 mol%, resp. The absorption spectra of **Mg:Fe:LiNbO3**, Fe:**LiNbO3**, and Mg:**LiNbO3** crystals and the IR transmission spectra of the **Mg:Fe:LiNbO3** crystal were measured. There is an absorption peak at 480 nm in the **Mg:Fe:LiNbO3** crystal which corresponds to Fe2+ absorption. There are 2 absorption peaks which lie at 500 and 1200 nm in the Mg:**LiNbO3** crystal and they correspond to oxide vacancy F center (VO2+ + 2e-) and Mg+ absorption; but the 2 absorption peaks in the **Mg:Fe:LiNbO3** crystal are very weak and even vanish. This is due to the fact that after Fe ions enter the crystal, Fe3+ will trap the electrons which are excited by treating the samples at high temp. and reduced condition; in this case, the electrons cannot combine with the oxide vacancy VO2+ and Mg2+ to produce an F center and Mg+.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(IR transmission spectra of magnesia- and iron-**doped**)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST IR spectra lithium niobate crystal; **iron magnesium doped** lithium niobate; UV visible absorption spectra lithium niobate; transmission spectra lithium niobate

IT Infrared spectra
Ultraviolet and visible spectra
(of magnesium- and iron-**doped** lithium niobate)

IT 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties
(IR transmission spectra of lithium niobate crystal **doped** with)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(IR transmission spectra of magnesia- and iron-**doped**)

L54 ANSWER 11 OF 11 HCA COPYRIGHT 2003 ACS on STN
111:200258 New oxyfluorides and highly densified ceramics related to lithium niobate. Ye, Zuo Guang; Von der Muhll, Regnault; Ravez, Jean (Lab. Chim. Solide, Univ. Bordeaux I, Talence, 33405, Fr.). Journal of Physics and Chemistry of Solids, 50(8), 809-12 (French) 1989. CODEN: JPCSAW. ISSN: 0022-3697.

AB Ferroelec. oxyfluorides with structures related to that of LiNbO3

were prepd. in sealed tubes by the compensated substitution Nb5+ + 3O2- = Mg2+ + 3F-. Highly densified ceramics can be obtained at 900.degree. by sintering in air. Partial hydrolysis of the fluorides by moisture in the air enhances the densification of these materials.

IT **123551-24-6**, Iron lithium magnesium niobium oxide (Fe0-0.2LiMg0-0.06Nb0.94-1O2.8-3)
(ceramics, ferroelec., sintering and densification of)

RN 123551-24-6 HCA

CN Iron lithium magnesium niobium oxide (Fe0-0.2LiMg0-0.06Nb0.94-1O2.8-3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	2.8 - 3	17778-80-2
Nb	0.94 - 1	7440-03-1
Mg	0 - 0.06	7439-95-4
Li	1	7439-93-2
Fe	0 - 0.2	7439-89-6

CC 57-2 (Ceramics)
Section cross-reference(s): 76

IT **123551-24-6**, Iron lithium magnesium niobium oxide (Fe0-0.2LiMg0-0.06Nb0.94-1O2.8-3)
(ceramics, ferroelec., sintering and densification of)

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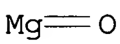
L55 ANSWER 1 OF 12 HCA COPYRIGHT 2003 ACS on STN

139:252827 Method for preparation of crystal plate of near-stoichiometric Li niobate. Kong, Yongfa; Xu, Jingjun; Chen, Yunlin; Chen, Xiaojun; Huang, Hui; Sun, Qian; Tang, Boquan; Yan, Wenbo; Liu, Hongde; Wang, Yan; Zhang, Guangyin (Nankai University, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1362546 A 20020807, 4 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 2001-144332 20011217.

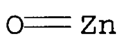
AB Near stoichiometric lithium niobate crystals contg. >49% Li2O for optoelectronic device application can be grown by vapor phase equil. method. The Li niobate crystal plate contains .gtoreq.49 mol.% Li2O and may contain **dopants** such as **MgO**, **ZnO**, **In2O3**, **Fe2O3**, CuO, Mn2O3, Ce2O3, Yb2O3, Cr2O3, Er2O3, or Nd2O3. It is grown by heating a mixt. of **Li2CO3** and **Nb2O5** f at 800-950.degree. and calcining at 950-1150.degree. for 1-5 h. The obtained powder and lithium niobate crystal plates are heated in a closed crucible at 1000-1200.degree. for 1-1000 h to obtain near-stoichiometric Li niobate. The material is a multi-functional photoelec. material, and can be used for surface wave filters, photoelec. switch, optical waveguide, optical amplifier or optical storage device.

IT **1309-37-1**, **F rric oxide**, uses

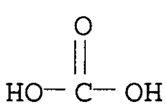
1309-48-4, Magnesium oxide (MgO
), uses **1312-43-2, Indium oxide (**
In2O3) **1314-13-2, Zinc oxide (**
ZnO), uses
(prepn. of near stoichiometric lithium niobate crystal for
optoelectronic applications.)
RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 1312-43-2 HCA
CN Indium oxide (In2O3) (6CI, 8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)



IT **554-13-2, Lithium carbonate**
(prepn. of near stoichiometric lithium niobate crystal for
optoelectronic applications.)
RN 554-13-2 HCA
CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

IC ICM C30B029-30
ICS C30B001-00; C30B001-04
CC 75-1 (Crystallography and Liquid Crystals)
Section cross-reference(s): 49, 73
IT 1308-38-9, Chromium oxide (Cr2O3), uses **1309-37-1,**
Ferric oxide, uses **1309-48-4,**
Magnesium oxide (MgO), uses
1312-43-2, Indium oxide (In2O3
) 1313-97-9, Neodymium oxide (Nd2O3) **1314-13-2,**
Zinc oxide (ZnO), uses 1314-37-0,
Ytterbium oxide (Yb2O3) 1317-34-6, Manganese oxide (Mn2O3)
1317-38-0, Cupric oxide, uses 1345-13-7, Cerium oxide (Ce2O3)

12057-24-8, Lithium oxide (Li2O), uses 12061-16-4, Erbium oxide (Er2O3)
(prepn. of near stoichiometric lithium niobate crystal for optoelectronic applications.)

IT **554-13-2, Lithium carbonate**
(prepn. of near stoichiometric lithium niobate crystal for optoelectronic applications.)

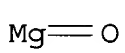
L55 ANSWER 2 OF 12 HCA COPYRIGHT 2003 ACS on STN

139:252826 Near-stoichiometric Li niobate crystal and method for its growth. Kung, Yongfa; Xu, Jingjun; Chen, Xiaojun; Huang, Zhihen; Li, Bing; Huang, Hui; Sun, Qian; Tang, Boquan; Chen, Shaolin; Zhang, Ling; Liu, Shiguo; Zhang, Guangyin (Nankai University, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1362545 A 20020807, 5 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 2001-144331 20011217.

AB The lithium niobate near stoichiometric crystal are grown from melt in K2O flux with **dopants** such as **MgO**, **ZnO**, **In2O3**, **Fe2O3**, CuO, Mn2O3, Ce2O3, Yb2O3, Cr2O3, Er2O3, or Nd2O3. A powd. mixt. contg. **Li2CO3**, **Nb2O5** (**Li2CO3/Nb2O5** ratio = 46-58:42-54), and oxide **MgO**, **ZnO**, **In2O3**, **Fe2O3**, CuO, Mn2O3, Ce2O3, Yb2O3, Cr2O3, Er2O3, or Nd2O3, and 2-15% K2O was used. The mixt. was heated at 800-950.degree. for 2-5 h for decompn. of **Li2CO3**, and then calcining at 1000-1150.degree. for 2-8 h to obtain powd. Li niobate. The powder of lithium niobate was pressed into compact, melting the compact in a Pt crucible, and crystal pulling at 15-30 rpm at temp. difference 15-25.degree. at the liq.-gas interface, and temp. gradient 1.0-2.5.degree./mm in the melt and 0.5-2.0.degree./mm near the melt surface. The lithium niobate can used as multi-functional photoelec. material and devices.

IT **1309-37-1**, **Ferric oxide**, uses **1309-48-4**, **Magnesium oxide** (**MgO**), uses **1312-43-2**, **Indium oxide** (**In2O3**) **1314-13-2**, **Zinc oxide** (**ZnO**), uses
(crystal growth of near-stoichiometric lithium niobate with alkali **dopant** using potassium oxide flux for optical device application)

RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 1312-43-2 HCA
CN Indium oxide (In2O3) (6CI, 8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)

O=Zn

IC ICM C30B029-30
ICS C30B015-00
CC 75-1 (Crystallography and Liquid Crystals)
ST lithium niobate growth potassium oxide flux alkali **doping**
IT Crystal growth
Optoelectronic semiconductor devices
(crystal growth of near-stoichiometric lithium niobate with alkali **dopant** using potassium oxide flux for optical device application)
IT Transition metals, uses
(**dopants**; crystal growth of near-stoichiometric lithium niobate with alkali **dopant** using potassium oxide flux for optical device application)
IT 1308-38-9, Chromium oxide (Cr2O3), uses **1309-37-1**, **Ferric oxide**, uses **1309-48-4**, **Magnesium oxide** (**MgO**), uses **1312-43-2**, **Indium oxide** (**In2O3**) 1313-97-9, Neodymium oxide (Nd2O3) **1314-13-2**, **Zinc oxide** (**ZnO**), uses 1314-37-0, Ytterbium oxide (Yb2O3) 1317-34-6, Manganese oxide (Mn2O3) 1317-38-0, Cupric oxide, uses 1345-13-7, Cerium oxide (Ce2O3) 12061-16-4, Erbium oxide (Er2O3) 12136-45-7, Potassium oxide (K2O), uses
(crystal growth of near-stoichiometric lithium niobate with alkali **dopant** using potassium oxide flux for optical device application)
IT 12031-63-9P, Lithium niobate
(crystal growth of near-stoichiometric lithium niobate with alkali **dopant** using potassium oxide flux for optical device application)

L55 ANSWER 3 OF 12 HCA COPYRIGHT 2003 ACS on STN
138:244871 Light-induced backward scattering in **LiNbO3**: **Fe,Zn**. Wu, Qiang; Xu, Jingjun; Sun, Qian; Zhang, Xinzheng; Qiao, Haijun; Tang, Baiquan; Zhang, Guangyin; Gu, Min (College of Physical Science, Photonics Research Center, Nankai University, Tianjin, 300071, Peop. Rep. China). Applied Physics Letters, 81(25), 4691-4693 (English) 2002. CODEN: APPLAB. ISSN: 0003-6951. Publisher: American Institute of Physics.
AB The authors studied the light-induced backward scattering in **doubly doped** Li niobate crystals and obsd. an intensity threshold effect. Scattering microregions are locally recorded in the sample by holog. interaction due to the existence of the threshold effect. Exptl. results of multilayer recording point out that this property could be used for high-d. multilayer-like bit data optical storage while keeping high signal-to-noise ratio.

IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(Fe- and Zn-**doped** **LiNbO3**; light-induced
backward scattering in **LiNbO3**:**Fe**,**Zn**
)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 74
ST **iron** **zinc** lithium niobate laser scattering
backward holog grating
IT Laser radiation scattering
(backward; light-induced backward scattering in **LiNbO3**:
Fe,**Zn**)
IT Holographic diffraction gratings
(light-induced backward scattering in **LiNbO3**:**Fe**
,**Zn**)
IT 7439-89-6, Iron, properties 7440-66-6, Zinc, properties
(Fe- and Zn-**doped** **LiNbO3**; light-induced
backward scattering in **LiNbO3**:**Fe**,**Zn**
)
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(Fe- and Zn-**doped** **LiNbO3**; light-induced
backward scattering in **LiNbO3**:**Fe**,**Zn**
)

L55 ANSWER 4 OF 12 HCA COPYRIGHT 2003 ACS on STN
137:255205 Series of excellent holographic photorefractive storage
materials - **Doubly** **doped** lithium niobate
crystals. Kong, Yong-fa; Xu, Jing-jun; Li, Guan-gao; Huang,
Zi-heng; Chen, Shao-lin; Li, Bing; Chen, Yun-lin; Zhang, Ling; Liu,
Shi-guo; Yan, Wen-bo; Liu, Hong-de; Wang, Yan; Qian, Sung; Zhang,
Xin-zheng; Zhang, Guo-quan; Huang, Hui; Zhang, Wan-Lin; Zhang,
Guang-Yin (R & D Center for Photon-Electro Materials, Nankai
University, Tianjin, 300071, Peop. Rep. China). Rengong Jingti
Xuebao, 31(3), 310-313 (Chinese) 2002. CODEN: RJXUEN. ISSN:
1000-985X. Publisher: Rengong Jingti Xuebao Bianjibu.
AB Various **doped** lithium niobate crystals have been grown by
Czochralski method in air. Three **doubly** **doped**
lithium niobate crystals, LN: **Fe**, **Mg**; LN: Fe, In
and LN: **Fe**, **Zn** were found having excellent
holog. photorefractive properties: a high diffraction efficiency (as
high as 60-80%), a fast response speed for photorefraction (an order
of magnitude faster than iron **doper** LiNO3), and a high
resistance to optical scattering (near two orders of magnitude
larger LN:Fe). The relationships between light-intensity threshold
effect and holog. writing and incident light-intensity were
investigated. And the exptl. results show there is a max.
light-signal gain near the light intensity threshold. A concept of
best writing light was introduced. The other exptl. results show
that **doubly** **doped** lithium niobate crystals have

better thermal fixing properties than mono-**doped** LN:Fe crystal, that are faster fixing time, higher fixing efficiency, and longer life time.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(Iron and Magnesium or Zinc **doped**; **doubly** **doped** lithium niobate crystals for holog. photorefractive storage materials)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 74-9 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST holog photorefractive lithium niobate **doped** crystals

IT Activation energy
Czochralski crystal growth
Holography
Photorefractive gratings
Photorefractive materials
(**doubly doped** lithium niobate crystals for holog. photorefractive storage materials)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(Iron and Magnesium or Zinc **doped**; **doubly** **doped** lithium niobate crystals for holog. photorefractive storage materials)

IT 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7440-66-6, Zinc, uses 7440-74-6, Indium, uses
(**dopant** to lithium niobate; **doubly** **doped** lithium niobate crystals for holog. photorefractive storage materials)

L55 ANSWER 5 OF 12 HCA COPYRIGHT 2003 ACS on STN

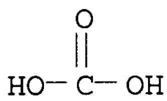
137:26041 Effect of Mg2+ on photorefractive response time of Fe:LiNbO3 crystal. Wang, Rui; Xu, Yanling; Wei, Yongde; Zhao, Chaozhong (Dep. Applied Chem., Harbin Inst. Technology, Harbin, 150001, Peop. Rep. China). Guangzi Xuebao, 30(11), 1307-1309 (Chinese) 2001. CODEN: GUXUED. ISSN: 1004-4213. Publisher: Kexue Chubanshe.

AB Fe:LiNbO3 crystals **doped** with 3 mol% and 6 mol% of Mg2+ were grown. The photoscattering resistance ability, diffraction efficiency, response time and photoconduction of those crystals were measured, and the correlation between response time and photocond. was deduced. The photo scattering resistance ability of Mg(6 mol%):Fe:LiNbO is one order of magnitude higher than that of Fe:LiNbO3, and the response rate of Mg(6 mol%):Fe:LiNbO3 is four times faster than that of Fe: LiNbO3.

IT **554-13-2, Lithium carbonate**
1309-37-1, Iron oxide, reactions
1309-48-4, Magnesium oxide, reactions
1313-96-8, Niobium oxide
(starting material for prepg. Fe: LiNbO3 crystal **doped** with Mg2+)

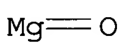
RN 554-13-2 HCA

CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)



2 Li

RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 1313-96-8 HCA
CN Niobium oxide (Nb2O5) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73
ST iron lithium niobate crystal magnesium **dopant** photorefractive grating holog
IT **Doping**
Holography
Photorefractive gratings
(effect of Mg2+ on photorefractive response time of Fe: LiNbO3 crystal)
IT **554-13-2**, **Lithium carbonate**
1309-37-1, **Iron oxide**, reactions
1309-48-4, **Magnesium oxide**, reactions
1313-96-8, Niobium oxide
(starting material for prepg. Fe: LiNbO3 crystal **doped** with Mg2+)

L55 ANSWER 6 OF 12 HCA COPYRIGHT 2003 ACS on STN
135:233531 Photorefractive effect of **double doped** Ce:Co:KNSBN crystal. Xu, Yuheng; Wang, Jun; Sun, Chengjun; Zhao, Chaozhong (Department of Applied Chemistry, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Ferroelectrics, 253(1-4), 185-192 (English) 2001. CODEN: FEROA8. ISSN: 0015-0193. Publisher: Gordon & Breach Science Publishers.
AB The Ce:Co:KNSBN crystal was grown for the 1st time by Czochralski technique. The Crystal has a higher exponential gain coeff., the diffraction efficiency, the phase conjugate reflectivity and self-pumped phase conjugate reflectivity than the undoped KNSBN crystal. The simple iterative holog. storage was realized by using

a Ce:Co:KNSBN crystal as a storage device and a **Zn**:
Fe:**LiNbO3** crystal as photorefractive crystal
amplifier, resp.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. optical storage using cerium, cobalt **doped**
barium niobium potassium sodium strontium oxide combined with
zinc iron doped lithium niobate
amplifier)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 74
ST cerium cobalt **doped** barium niobium potassium sodium
strontium oxide; photorefractive effect holog storage
IT Optical recording
(holog.; photorefractive effect of cerium, cobalt **doped**
barium niobium potassium sodium strontium oxide for)
IT Crystal growth
Optical gain
(of cerium, cobalt **doped** barium niobium potassium
sodium strontium oxide)
IT Photorefractive effect
(photorefractive effect of cerium, cobalt **doped** barium
niobium potassium sodium strontium oxide)
IT Degenerate four wave mixing
(photorefractive effect of cerium, cobalt **doped** barium
niobium potassium sodium strontium oxide studied by)
IT 7439-89-6, Iron, properties 7440-66-6, Zinc, properties
(holog. optical storage using cerium, cobalt **doped**
barium niobium potassium sodium strontium oxide combined with
zinc iron doped lithium niobate
amplifier)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. optical storage using cerium, cobalt **doped**
barium niobium potassium sodium strontium oxide combined with
zinc iron doped lithium niobate
amplifier)
IT 7440-45-1, Cerium, properties 7440-48-4, Cobalt, properties
(photorefractive effect of cerium, cobalt **doped** barium
niobium potassium sodium strontium oxide)
IT 115429-06-6
(photorefractive effect of cerium, cobalt **doped** barium
niobium potassium sodium strontium oxide)

L55 ANSWER 7 OF 12 HCA COPYRIGHT 2003 ACS on STN
135:233185 Optical properties and applications of **double-
doped** In:Fe:**LiNbO3** crystal. Wang, Rui; Xu,
Wusheng; Liu, Xinrong; Xu, Xinguang (Department of Applied
Chemistry, Harbin Institute of Technology, Harbin, 150001, Peop.
Rep. China). Ferroelectrics, 253(1-4), 145-151 (English) 2001.

CODEN: FEROA8. ISSN: 0015-0193. Publisher: Gordon & Breach Science Publishers.

AB **LiNbO3** crystals **doped** with In2O in different concns. and Fe2O3 in the same concn. were studied. The IR transmission spectra of In:Fe:**LiNbO3** crystals were measured and their holog. storage properties were studied. The response time and photo scattering resistance ability of In:Fe: **LiNbO3** exceed that of Fe:**LiNbO3**. When In:Fe: **LiNbO3** was used as storage material and phase conjugate mirror to realize the holog. assocn. storage expt., better results were obtained.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical properties and applications of indium and iron-**doped** lithium niobate crystal)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 74

ST **indium iron doped** lithium niobate holog storage IR transmission

IT Optical recording
(holog.; indium and iron-**doped** lithium niobate crystal for)

IT IR spectra
(of indium and iron-**doped** lithium niobate crystal)

IT Optical damage threshold
(optical damage threshold of indium, and iron **doped** lithium niobate)

IT Optical properties
(optical properties and applications of indium and iron-**doped** lithium niobate crystal)

IT Mirrors
(phase-conjugating; indium and iron-**doped** lithium niobate crystal as)

IT 7439-89-6, Iron, properties 7440-74-6, Indium, properties
(optical properties and applications of indium and iron-**doped** lithium niobate crystal)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical properties and applications of indium and iron-**doped** lithium niobate crystal)

L55 ANSWER 8 OF 12 HCA COPYRIGHT 2003 ACS on STN

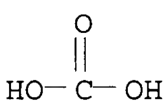
135:84385 **Doped** lithium niobate crystal. Kong, Yongfa; Xu, Jingjun; Li, Guangao; Sun, Qian; Zhang, Guoquan; Huang, Ziheng; Chen, Shaolin; Chen, Xiaojun; Zhang, Guangyan (Nankai University, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1277271 A 20001220, 4 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 2000-121092 20000720.

AB The title crystals are described by the general formula Li1-xNb1+yO3:Fem,Mn (M = Mg, In, or Zn; 0.05 .ltoreq. x .ltoreq.

0.13; 0.00 .ltoreq. y .ltoreq. 0.01; 5.0 x 10-5 .ltoreq. m .ltoreq. 7.5 x 10-4; 0.02 .ltoreq. qn .ltoreq. 0.13; and q is the valence state of M). Methods of prepg. the crystals are also described which entail mixing **Li2CO3**, Nb2O3, **Fe2O3**, and **MgO**, **In2O3**, or **ZnO**; holding at 850.degree. for 2 h to decomp. **Li2CO3**; sintering at 1100.degree. for 2 to obtain **doped** Li niobate powder; growing by Czochralski pulling method at pulling speed 1-3 mm, rotary speed 15-30 rpm, temp. difference 20.degree., temp. gradient in melt 1.5.degree. mm-1, and temp. gradient above melt 1.0.degree. mm-1; and annealing at 1200.degree.. The crystal can be used as three-dimensional holog. storage material.

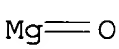
IT **554-13-2**, **Lithium carbonate** **1309-37-1**, **Iron oxide** (**Fe2O3**), reactions **1309-48-4**, **Magnesium oxide**, reactions **1312-43-2**, **Indium oxide** **1313-96-8**, Niobium oxide **1314-13-2**, **Zinc oxide**, reactions
(**doped** lithium niobate crystals and their prodn.)

RN 554-13-2 HCA
CN Carbonic acid, dilithium salt (8CI, 9CI) (CA INDEX NAME)

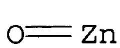


2 Li

RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 1312-43-2 HCA
CN Indium oxide (In2O3) (6CI, 8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1313-96-8 HCA
CN Niobium oxide (Nb2O5) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)



IC ICM C30B029-30
ICS C30B015-00
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73, 75
ST lithium niobate crystal growth **doping**
IT Czochralski crystal growth
Holographic recording materials
(**doped** lithium niobate crystals and their prodn.)
IT 12031-63-9DP, Lithium niobate, nonstoichiometric
(**doped** lithium niobate crystals and their prodn.)
IT **554-13-2**, **Lithium carbonate**
1309-37-1, **Iron oxide** (**Fe2O3**),
reactions **1309-48-4**, **Magnesium oxide**,
reactions **1312-43-2**, **Indium oxide**
1313-96-8, Niobium oxide **1314-13-2**, **Zinc oxide**, reactions
(**doped** lithium niobate crystals and their prodn.)
IT 7439-95-4P, Magnesium, processes 7440-66-6P, Zinc, processes
7440-74-6P, Indium, processes
(lithium niobate **doped** with iron and; **doped** lithium niobate crystals and their prodn.)
IT 7439-89-6P, iron, processes
(lithium niobate **doped** with; **doped** lithium niobate crystals and their prodn.)

L55 ANSWER 9 OF 12 HCA COPYRIGHT 2003 ACS on STN
133:245001 Experimental study of non-volatile holographic storage in **doubly**- and triply-**doped** lithium niobate crystals.
Liu, Y.; Liu, L.; Xu, L.; Zhou, C. (Shanghai Institute of Optics and Fine Mechanics, Chinese Academy Sciences, Shanghai, 201800, Peop. Rep. China). Optics Communications, 181(1,2,3), 47-52 (English) 2000. CODEN: OPCOB8. ISSN: 0030-4018. Publisher: Elsevier Science B.V..
AB Four kinds of lithium niobate crystals **doped** with Cu:Ce, Mn:Cu:Ce, Mn:Fe, and Mn:**Fe**:**Mg** processed under oxidn. or redn. conditions were studied exptl. for the photorefractive nonvolatile holog. storage with UV sensitizing and red light recording. It is shown that only highly oxidized crystals are able to realize nonvolatile holog. storage. On the condition of nonvolatile holog. storage with high signal-to-noise ratio, the nonvolatile diffraction efficiency of the oxidized **LiNbO3** :Cu:Ce crystal is the highest among all studied samples, and the recording sensitivity and the dynamic range of the oxidized **LiNbO3**:Mn:Fe crystal are the highest.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(nonvolatile holog. storage in **doubly** and triply **doped** lithium niobate crystals)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
ST **doping** lithium niobate holog storage
IT **Doping**
Holographic memory devices
Oxidation
Physical process kinetics
Reduction
(nonvolatile holog. storage in **doubly** and triply
doped lithium niobate crystals)
IT UV and visible spectra
(transmission; nonvolatile holog. storage in **doubly** and
triply **doped** lithium niobate crystals)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(nonvolatile holog. storage in **doubly** and triply
doped lithium niobate crystals)
IT 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7439-96-5,
Manganese, uses 7440-45-1, Cerium, uses 7440-50-8, Copper, uses
(nonvolatile holog. storage in **doubly** and triply
doped lithium niobate crystals)

L55 ANSWER 10 OF 12 HCA COPYRIGHT 2003 ACS on STN
133:81247 Photorefractive light-induced scattering in **doped**
lithium niobate crystals. Kamber, Nouel Y.; Xu, Jingjun; Mikha,
Sonia M.; Zhang, Guoquan; Zhang, Xinzheng; Liu, Simin; Zhang,
Guangyin (Photonics Research Center, College of Physics Science,
Nankai University, Tianjin, 300071, Peop. Rep. China). Optik
(Jena), 111(3), 107-112 (English) 2000. CODEN: OTIKAJ. ISSN:
0030-4026. Publisher: Urban & Fischer Verlag.
AB The authors have studied exptl. the photorefractive light-induced
scattering of three samples of **LiNbO3:Fe**,
Mg, **LiNbO3**:Fe,In, **LiNbO3:Fe**,
Zn, and the authors compare them with those obtained from
Fe-**doped LiNbO3** crystal to get better
understanding of the phys. mechanism. The **doping** the
LiNbO3 crystal with suitable concn. of Fe and
damage-resistant **dopants** will reduce the concn. of Fe ions
on the Li sites, which will result in the suppression of the
photorefractive light-induced scattering and increase of the
so-called threshold light intensity. The authors demonstrated the
advantage of the fanning-noise-free **double-doped**
photorefractive **LiNbO3** crystals for the three-dimension
storage. This method to suppress the fanning noise is very simple
and convenient to practice.
IT **12031-63-9**, Lithium niobate **LiNbO3**
(photorefractive light-induced scattering in **doped**
lithium niobate crystals)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)

IT **Doping**
(effect of; photorefractive light-induced scattering in **doped** lithium niobate crystals)
IT Light scattering
Optical transmission
Photorefractive effect
Photorefractive materials
(photorefractive light-induced scattering in **doped** lithium niobate crystals)
IT 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties 7440-66-6, Zinc, properties 7440-74-6, Indium, properties
(**dopant**; photorefractive light-induced scattering in **doped** lithium niobate crystals)
IT **12031-63-9**, Lithium niobate **LiNbO3**
(photorefractive light-induced scattering in **doped** lithium niobate crystals)

L55 ANSWER 11 OF 12 HCA COPYRIGHT 2003 ACS on STN
127:142710 Photorefractive **Zn,Fe:LiNbO3** crystal for image edge enhancement application. Du, Li; Zhou, Yuxiang; Su, Rongjun; Li, Minghua (Dep. Applied Chem., Harbin Institute Technology, Harbin, 150001, Peop. Rep. China). Rengong Jingti Xuebao, 26(2), 155-157 (Chinese) 1997. CODEN: RJXUEN. ISSN: 1000-9868. Publisher: Huaxue Gongye Chubanshe.
AB Employing the **double-doped Zn, Fe:LiNbO3** crystal as a hologram storage medium, and the Cu:KNSBN crystal as a self-pump phase conjugate mirror, all-optical real-time image edge enhancement has been realized. The holog. properties of **Zn, Fe:LiNbO3** are discussed.
IT **12031-63-9**, Lithium niobate(**LiNbO3**)
(photorefractive **double-doped** lithium niobate crystal for image edge enhancement application)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST **doped** lithium niobate holog storage; image edge enhancement photorefractive lithium niobate
IT Mirrors
(phase-conjugating; photorefractive **double-doped** lithium niobate hologram storage medium and Cu:KNSBN self-pump phase conjugate mirror for image edge enhancement application)
IT Holography
Imaging
(photorefractive **double-doped** lithium niobate crystal as hologram storage medium for image edge enhancement application)
IT **12031-63-9**, Lithium niobate(**LiNbO3**)
(photorefractive **double-doped** lithium niobate

crystal for image edge enhancement application)

IT 7439-89-6, Iron, uses 7440-66-6, Zinc, uses
(photorefractive **double-doped** lithium niobate
crystal for image edge enhancement application)

IT 129947-31-5, KNSBN
(photorefractive **double-doped** lithium niobate
hologram storage medium and Cu:KNSBN self-pump phase conjugate
mirror for image edge enhancement application)

IT 7440-50-8, Copper, uses
(photorefractive **double-doped** lithium niobate
hologram storage medium and Cu:KNSBN self-pump phase conjugate
mirror for image edge enhancement application)

L55 ANSWER 12 OF 12 HCA COPYRIGHT 2003 ACS on STN

96:96221 Composite function element. Itakura, Gen; Matsuo, Yoshitiro (Matsushita Electric Industrial Co., Ltd. , Japan). Eur. Pat. Appl. EP 41379 A2 19811209, 18 pp. DESIGNATED STATES: R: DE, FR, GB, IT, NL. (English). CODEN: EPXXDW. APPLICATION: EP 1981-302383 19810529. PRIORITY: JP 1980-73060 19800530.

AB A composite function element is described which can act as a varistor and a capacitor simultaneously. It consists of a high-resistance film layer contg. the constitutional elements of a perovskite-type oxide and specified impurity elements at the grain boundaries of a sintered agglomerate of semiconductor particles. For example, a sintered product with sp. resistance 0.2-0.5 .OMEGA.-cm and av. particle diam. 10-20 .mu. was prepd. by adding 0.1-0.5 mol% **Nb2O5** to a com. powder of SrTiO3, homogenizing, and diring at 1350-1420.degree.. A diffusing compn. contg., e.g., Bi2O3 90, CeO2 5, and SrTiO3 5 mol% was attached to the surface of the sintered product in amts. <1/100 part by wt./1 part of wt. of sintered product and allowed to diffuse 1-5 h at 1000-1300.degree., after which baked Ag electrodes were attached. The material obtained had varistor voltage 83 V/m, voltage nonlinearity index 5, dielec. const. 47,300, and dielec. loss angle 1.6%. Other diffusing compns. included B2O3, CoO, CuO, **Fe2O3**, La2O3, mNO2, **Nb2O5**, Sb2O3, SiO2, **ZnO**, TiO2, and **Li2CO3** as components.

IC H01C007-10; C04B035-46; H01G004-12

CC 76-2 (Electric Phenomena)

IT 7439-89-6, properties 7439-91-0, properties 7439-93-2, properties 7439-96-5, properties 7440-03-1, properties 7440-21-3, properties 7440-32-6, properties 7440-36-0, properties 7440-42-8, properties 7440-45-1, properties 7440-48-4, properties 7440-50-8, properties 7440-66-6, properties 7440-69-9, properties
(varistor-capacitor composite function elements from perovskite
sintered films **doped** with)

IT 12036-39-4 12047-27-7, properties 12047-27-7D, solid solns. with strontium titanate 12049-50-2D, solid solns. with strontium titanate 12060-00-3D, solid solns. with strontium titanate 12060-59-2 12060-59-2D, solid solns. with perovskites 12143-34-9D, solid solns. with strontium titanate

(varistor-capacitor composite function elements from sintered films of, with grain boundary **dopants**)

=> d l63 1-12 cbib abs hitstr hitind

L63 ANSWER 1 OF 12 HCA COPYRIGHT 2003 ACS on STN
139:267189 Photo-refractive properties of Mg:In:Fe:**LiNbO3** crystal. Shi, Liangsheng; Wang, Rui; Wang, Biao (Mechanical and Power Engineering College, Harbin University of Science and Technology, Harbin, Peop. Rep. China). Journal of Crystal Growth, 256(1-2), 103-106 (English) 2003. CODEN: JCRGAE. ISSN: 0022-0248. Publisher: Elsevier Science B.V..

AB Mg:In:Fe:**LiNbO3** crystals were grown using the **Czochralski** technique by **doping LiNbO3** with **MgO**, **In2O3** and Fe2O3. IR absorption spectra of the crystals were measured and the mechanisms underlying the OH- absorption peak shift to shorter wavelengths were studied. The photo-refractive threshold of Mg:In:Fe:**LiNbO3** crystals was measured by direct observation of the transmission facula distortion. The photo-refractive properties of Mg:In:Fe: **LiNbO3** crystal were initially studied for the case when the concn. of co-**doping** with Mg2+ and In3+ ions was below their threshold level. The photo-damage threshold of Mg(3 mol%):In(2 mol%):Fe(0.06%):**LiNbO3** crystals was 2 orders of magnitude higher than that of Fe:**LiNbO3**.

IT **12031-63-9P**, Lithium niobate (**LiNbO3**)
    (photorefractive properties of Mg:In:Fe:**LiNbO3** crystal)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
    Section cross-reference(s): 75

ST photorefraction magnesium **indium iron** lithium niobate crystal

IT IR spectra
    (of magnesium,**indium**,**iron-doped** lithium niobate)

IT Optical damage threshold
    (photo-damage threshold of magnesium,**indium**, **iron-doped** lithium niobate)

IT Optical diffraction
    (photo-refractive properties of Mg:In:Fe:**LiNbO3** crystal in relation to)

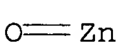
IT Photorefractive effect
    (photorefractive properties of Mg:In:Fe:**LiNbO3** crystal)

IT **Czochralski** crystal growth
    (photorefractive properties of Mg:In:Fe:**LiNbO3** crystal grown by)

IT 7439-89-6P, Iron, uses 7439-95-4P, Magnesium, uses 7440-74-6P, Indium, uses

(photorefractive properties of Mg:In:Fe:**LiNbO3** crystal)
IT **12031-63-9P**, Lithium niobate (**LiNbO3**)
(photorefractive properties of Mg:In:Fe:**LiNbO3** crystal)

L63 ANSWER 2 OF 12 HCA COPYRIGHT 2003 ACS on STN
139:237588 Study on holographic associate storage with self-pumping phase conjugate mirror. Zhao, Yequan; Zhen, Xihe; Wang, Yijie; Liu, Caixia; Xu, Yuheng (Electro-Optics Information Technology Center, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 5060(Optical Storage), 235-238 (English) 2003. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.
AB CuO and Co2O3 were **doped** in KNSBN and **Czochralski** method was used to grow Cu:Co:KNSBN crystal for the first time. **ZnO** and Fe2O3 were **doped** in **LiNbO3** and **Czochralski** method was used to grow **Zn**:**Fe**:**LiNbO3** crystals. The diffraction efficiency and response time of the **Zn**:**Fe**:**LiNbO3** crystals were measured. The response speed of the **Zn**:**Fe**:**LiNbO3** crystal is four times higher than that of the Fe:**LiNbO3** crystal. The self-pumping phase conjugate reflectivity and respond time of the Cu:Co:KNSBN crystal were measured. The result shows that the self-pumping phase conjugate reflectivity of the Cu:Co:KNSBN crystal is two time higher than that of KNSBN crystal. **Zn**:**Fe**:**LiNbO3** and Cu:Co:KNSBN were used as storage element and self-pumping phase conjugate mirror, resp., to make the holog. associative storage expt. The excellent results were obtained.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. assoc. storage using **Zn**:**Fe**:**LiNbO3** with self-pumping phase conjugate Cu:Co:KNSBN crystal mirror)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **1314-13-2, Zinc oxide**, processes
(lithium niobate **doped** with; holog. assoc. storage using **Zn**:**Fe**:**LiNbO3** with self-pumping phase conjugate Cu:Co:KNSBN crystal mirror)
RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)



CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73
IT Holographic memory devices
Holography
(holog. assoc. storage using **Zn**:**Fe**:

LiNbO3 with self-pumping phase conjugate Cu:Co:KNSBN crystal mirror)

IT Mirrors
(phase-conjugating, self-pumping; holog. assoc. storage using **Zn**:**Fe**:**LiNbO3** with self-pumping phase conjugate Cu:Co:KNSBN crystal mirror)

IT 1308-04-9, Cobalt trioxide 1317-38-0, Copper monoxide, processes
(KNSBN crystal **doped** with; holog. assoc. storage with self-pumping phase conjugate mirror)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. assoc. storage using **Zn**:**Fe**: **LiNbO3** with self-pumping phase conjugate Cu:Co:KNSBN crystal mirror)

IT 1309-37-1, Iron trioxide, processes **1314-13-2**, **Zinc oxide**, processes
(lithium niobate **doped** with; holog. assoc. storage using **Zn**:**Fe**:**LiNbO3** with self-pumping phase conjugate Cu:Co:KNSBN crystal mirror)

IT 109302-25-2, KNSBN
(mirror; holog. assoc. storage using **Zn**:**Fe**: **LiNbO3** with self-pumping phase conjugate Cu:Co:KNSBN crystal mirror)

L63 ANSWER 3 OF 12 HCA COPYRIGHT 2003 ACS on STN
139:204969 First-order iteration associate storage of Ce:Eu:KNSBN crystal. Xu, Yuheng; Zhao, Chaozhong; Xu, Wusheng; Liu, Caixia (Department of Applied Chemistry, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 5060(Optical Storage), 223-226 (English) 2003. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB Using Si-Mo Bar as the heater, potassium sodium barium strontium niobate (KNSBN) crystals **doped** with Ce and/or Eu have been grown by the **Czochralski** method. The exponential gain coeffs. were measured by two-wave coupling light path, and in comparison with KNSBN, that of Ce:Eu:KNSBN is one time higher. Holog. associative storage principle is represented here and the holog. associative storage is realized by using Ce:Eu:KNSBN as the storage element and **Mg**:**Fe**:**LiNbO3** as the phase conjugator to feedback, fetch threshold and gain. The output images are integrated.

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST optical gain coeff KNSBN crystals **dopant** cerium europium

IT **Czochralski** crystal growth
Holographic memory devices
Optical gain
Photorefractive effect
(first-order iteration assoc. storage of potassium sodium barium strontium niobate (KNSBN) crystals **doped** with cerium and/or europium crystal)

IT 129947-31-5

(first-order iteration assoc. storage of potassium sodium barium strontium niobate (KNSBN) crystals **doped** with cerium and/or europium crystal)

IT 7440-45-1, Cerium, uses 7440-53-1, Europium, uses
(first-order iteration assoc. storage of potassium sodium barium strontium niobate (KNSBN) crystals **doped** with cerium and/or europium crystal)

L63 ANSWER 4 OF 12 HCA COPYRIGHT 2003 ACS on STN

138:392976 Study on photorefractive effect of Cu:Co:SrxBa1-xNb2O6 crystal. Zhao, Chaozhong; Yang, Chunhui; Shi, Liansheng (Department of Physics, Harbin Normal University, Harbin, 100080, Peop. Rep. China). Guisuanyan Xuebao, 31(2), 161-164 (Chinese) 2003. CODEN: KSYHA5. ISSN: 0454-5648. Publisher: Guisuanyan Xuebao Bianjishi.

AB **Doping** CuO and Co3O4 in the raw materials of SixBa1-xNb2O6 (SBN) crystal, Cu:Co:SBN crystals were grown by the **Czochralski** method, by using MoSi2 bar as the heating elements. The photorefractive properties of crystals were measured by the two-wave coupling expt. The max. diffraction efficiency of 74%, the max. change of refractive index of 7.9 x 10-5 and the photorefractive sensitivity of 4.8 .times. 10-4 cm3/J for Cu:Co:SBN crystals are obtained, and the dependence of the respond time on the light intensity is achieved. The self-pump phase conjugation reflectivity and response time were measured by using four-wave mixing light path. Using Cu:Co:SBN crystal as a storage element and using **Mg:Fe:LiNbO3** crystal as a phase conjugate reflector to gain the feedback system, the associative storage expt. is realized.

CC 74-9 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT **Czochralski** crystal growth
Holography
Photorefractive effect
Photorefractive materials
(photorefractive effect of Cu, Co **doped** SrxBa1-xNb2O6 crystal)

IT 1308-06-1, Cobalt oxide (Co3O4) 1317-38-0, Copper oxide, uses
(**dopant**; photorefractive effect of Cu, Co **doped** SrxBa1-xNb2O6 crystal)

IT 11115-70-1, SBN
(photorefractive effect of Cu, Co **doped** SrxBa1-xNb2O6 crystal)

L63 ANSWER 5 OF 12 HCA COPYRIGHT 2003 ACS on STN

136:28853 Investigation of mechanism of Co-**doped** Zn2+ and In3+ influence on optical properties of Fe:**LiNbO3**. Wang, Rui; Xu, Wusheng; Liu, Xinrong; Wang, Jiyang (Dept. of Applied Chemistry and Electro Optics Research Center, Harbin Inst. of Technology, Harbin, 150001, Peop. Rep. China). High Technology Letters, 7(2), 92-94 (English) 2001. CODEN: HTLEFC. ISSN: 1006-6748. Publisher: Editorial Department of High Technology Letters.

AB **Doping** Zn with the concn. of 3 mol% and **In2O3**

with different concn. in Fe:**LiNbO3**, Zn:In:Fe:
LiNbO3 crystals were grown. The IR spectra of the crystals were measured and the mechanism of the OH-, absorption peak shifting was studied. The diffraction efficiency, response time and photoconduction of the crystals were measured. The mechanisms of the photoconduction increasing, diffraction efficiency decreasing and response time shorting for those crystals were studied.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(mechanism of co-**doped** indium and zinc influence on optical properties of iron-**doped**)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 57

ST optical property zinc **indium iron** lithium niobate photoconduction

IT Holography
IR spectra
Optical diffraction
Photoconductivity
(co-**doped** indium and zinc influence mechanism on iron-**doped** lithium niobate)

IT **Czochralski** crystal growth
(of **indium-iron-zinc**-codoped lithium niobate)

IT 20074-52-6, Iron(3+), properties
(co-**doped** indium and zinc influence mechanism on optical properties of lithium niobate **dope** with)

IT 22537-49-1, Indium(3+), properties 23713-49-7, Zinc(2+), properties
(co-**doped** influence mechanism on optical properties of iron-**doped** lithium niobate)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(mechanism of co-**doped** indium and zinc influence on optical properties of iron-**doped**)

L63 ANSWER 6 OF 12 HCA COPYRIGHT 2003 ACS on STN

135:218612 Investigation of the holographic storage property and application of **Zn:Fe:LiNbO3**. Zhao, Ye Quan; Wang, Jun; Xu, Yu Heng; Zhao, Chao Zhong; Zhou, Guang Yong (Department of Mechanics and Space Engineering, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Ferroelectrics, 253(1-4), 177-183 (English) 2001. CODEN: FEROA8. ISSN: 0015-0193. Publisher: Gordon & Breach Science Publishers.

AB Fe:**LiNbO3** and **Zn:Fe:LiNbO3** were grown by **Czochralski** method. The diffraction efficiency, response time and photoconduction were detd. The effect of **dopant** concn. on response time was measured. The photoscattering resistance ability was measured and the mechanism was investigated.

IT **1314-13-2**, **Zinc oxide**, uses
(holog. storage property of **doped** lithium niobate)
RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)

O=Zn

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. storage property of **doped** lithium niobate)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST **zinc iron doped** photorefractive lithium niobate holog storage
IT Holographic memory devices
Holographic recording materials
Light scattering
Photoconductivity
(holog. storage property of **doped** lithium niobate)
IT **1314-13-2**, **Zinc oxide**, uses 7439-89-6, Iron, uses
(holog. storage property of **doped** lithium niobate)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. storage property of **doped** lithium niobate)

L63 ANSWER 7 OF 12 HCA COPYRIGHT 2003 ACS on STN
133:274112 Holographic storage property of In:Fe:**LiNbO3**. Xu, Wusheng; Wang, Rui; Li, Minghua; Xu, Yuheng (Dep. Appl. Chem., Harbin Institute of Technology, Harbin, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 3899(Photonics Technology into the 21st Century: Semiconductors, Microstructures, and Nanostructures), 468-474 (English) 1999. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.
AB **In2O3** and Fe2O3 were **doped** in **LiNbO3** and **Czochralski** method was used to grow In:Fe: **LiNbO3** crystals. The light scattering ability resistance, exponential gain coeff., diffraction efficiency and response time of the crystals were measured. The light scattering ability resistance and response time of In:Fe:**LiNbO3** is one magnitude higher than Fe:**LiNbO3**. In:Fe:**LiNbO3** was used as storage element to make the large capacity holog. storage and the holog. associative storage reality. The excellent results were gained.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. storage property of In:Fe:**LiNbO3**)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73, 75
ST holog memory lithium niobate **doping indium iron**
IT **Czochralski** crystal growth
Doping
Holographic memory devices
Light scattering
Optical diffraction
Photorefractive effect
(holog. storage property of In:Fe:**LiNbO3**)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. storage property of In:Fe:**LiNbO3**)
IT 7439-89-6, Iron, uses 7440-74-6, Indium, uses
(holog. storage property of In:Fe:**LiNbO3**)

133:96705 Growth of Ce:Cu:SrxBa1-xNb2O6 crystals and study of their self-pumped phase conjugation effect. Yang, Chunhui; Hou, Congfu; Xu, Wusheng; Xu, Yuheng; Wang, Jiyang (Department of Applied Chemistry, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Gaojishu Tongxun, 10(1), 93-95, 92 (Chinese) 2000. CODEN: GTONE8. ISSN: 1002-0470. Publisher: Gaojishu Tongxun Zazhishe.
AB Ce:Cu:SrxBa1-xNb2O6 crystals were grown by **doping** CeO2 and CuO in SrxBa1-xNb2O6 crystals by **Czochralski** method. The diffraction efficiency, self-pumped phase conjugation reflectivity, and response time were measured. The real-time holog. associative memory was obtained by using **Zn**:**Fe**: **LiNbO3** crystals as holog. record materials and Ce:Cu:SrxBa1-xNb2O6 crystals as phase conjugation mirrors.
CC 74-13 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 73, 75
IT Holography
(growth and use of cerium- and copper-**doped** barium strontium niobate crystals in)
IT Crystal growth
(of cerium- and copper-**doped** barium strontium niobate crystals)
IT 7440-50-8, Copper, properties
(growth and self-pumped phase conjugation of barium strontium niobate crystals **doped** with cerium and)
IT 7440-45-1, Cerium, properties
(growth and self-pumped phase conjugation of barium strontium niobate crystals **doped** with copper and)
IT 11115-70-1P, Barium strontium niobate
(growth and self-pumped phase conjugation of cerium- and copper-**doped**)

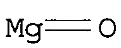
132:257455 Optical property of **LiNbO3** crystal codoped with In, Mg and Fe. Zhao, Yequan; Yang, Chunhui; Rui, Wang; Xu, Wusheng (Department of Applied Chemistry, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). High Technology Letters, 6(1), 59-62 (English) 2000. CODEN: HTLEFC. ISSN: 1006-6748. Publisher: Editorial Department of High Technology Letters.

AB **In2O3**, **MgO** and Fe2O3 were **doped** in **LiNbO3** and **Czochralski** method was used to grow In: **Mg**:**Fe**:**LiNbO3** crystals. The OH- extension transmission spectra, light scattering resistance ability, two wave coupled diffraction efficiency and response time of the crystal were measured. Codoping In and Mg in crystal will improve its light scattering resistance ability and response time. **Doping** In can increase the ability to replace anti-site Nb and decrease the **doping** quantity of Mg. All these are propitious to improve the optical homogeneity of crystal. **Doping** Fe can improve the photorefractive sensitivity for **LiNbO3** crystal. The authors discussed the site of In, Mg and Fe in **LiNbO3** crystals and the influence of the absorption peak of OH- transmission spectra on photorefractive property for **LiNbO3** crystal.

IT **1309-48-4**, **Magnesium oxide** (**MgO**), uses **1312-43-2**, **Indium oxide in2O3**
(optical property of **LiNbO3** crystal codoped with In, Mg and Fe)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 1312-43-2 HCA

CN Indium oxide (In2O3) (6CI, 8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT **12031-63-9**, Lithium niobate **linbo3**
(optical property of **LiNbO3** crystal codoped with In, Mg and Fe)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST optical property lithium niobate codoping indium **magnesium iron**

IT **Czochralski** crystal growth
IR spectra
Optical diffraction
(optical property of **LiNbO3** crystal codoped with In, Mg and Fe)

IT 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties 7440-74-6, Indium, properties

(optical property of **LiNbO3** crystal codoped with In, Mg and Fe)

IT 1309-37-1, Iron oxide (Fe_2O_3), uses **1309-48-4**, **Magnesium oxide** (**MgO**), uses **1312-43-2**, **Indium oxide in2O3**
(optical property of **LiNbO3** crystal codoped with In, Mg and Fe)

IT **12031-63-9**, Lithium niobate **linbo3**
(optical property of **LiNbO3** crystal codoped with In, Mg and Fe)

IT 14280-30-9, Hydroxide, occurrence
(optical property of **LiNbO3** crystal codoped with In, Mg and Fe and contg. hydroxides)

L63 ANSWER 10 OF 12 HCA COPYRIGHT 2003 ACS on STN

131:51939 Growth and photorefractive properties of bi-doped **LiNbO3** crystals. Xu, Yanling; Liu, Yingrong; Wang, Rui; Xu, Wusheng (Department of Applied Chemistry, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Rengong Jingti Xuebao, 28(2), 155-159 (Chinese) 1999. CODEN: RJXUEN. ISSN: 1000-9868. Publisher: Huaxue Gongye Chubanshe.

AB Abstr. Using **Czochralski** method, Fe **doped** and (**Zn**, **Fe**), (**Mg**, Fe), (Ce, Fe) bi-doped lithium niobate crystals were grown with the congruent melt ratio Li2CO3/Nb2O3 = 48.6/51.4. The quality, exponential gain coeff. and diffraction efficiency of Ce:Fe:**LiNbO3** are superior to that of Fe:**LiNbO3**.The light scattering ability resistances of (Zn,Fe), (Mg, Fe), (Ce, Fe) and Fe doped **LiNbO3** are 8.2 x 103, 3.2 x 102, 8.3 x 102 and 1.2 x 102 W/cm3 resp. Photorefractive measurements showed that the gain coeff. of heavily reduced Ce, Fe:**LiNbO3** reached to .GAMMA. = 40.2 cm-1 and a holog. efficiency .eta. = 82.2%. It is shown that Zn, Fe: **LiNbO3** and Mg, Fe:**LiNbO3** have the properties high light scattering resistance and quickly response. And Ce, Fe: **LiNbO3** has the highest gain and efficiency among those crystals investigated.

IT **12031-63-9P**, Lithium niobate (**LiNbO3**)
(growth and photorefractive property of Bi-doped **LiNbO3** crystal)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 75

IT Crystal growth
Crystals
Light scattering
(growth and photorefractive property of Bi-doped **LiNbO3** crystal)

IT 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties 7440-45-1, Cerium, properties 7440-66-6, Zinc, properties

(growth and photorefractive property of Bi-doped **LiNbO3** crystal)
IT **12031-63-9P**, Lithium niobate (**LiNbO3**)
(growth and photorefractive property of Bi-doped **LiNbO3** crystal)
IT 554-13-2, Lithium carbonate (Li2CO3) 12059-63-1, Niobium oxide (Nb2O3)
(growth and photorefractive property of Bi-doped **LiNbO3** crystal)

L63 ANSWER 11 OF 12 HCA COPYRIGHT 2003 ACS on STN
126:12987 Photorefractive Zn, Fe:**LiNbO3** crystal for real-time double-exposure interferometry application. Li, Minghua; Liu, Caixia; Xu, Kebin; Xu, Yuheng (Department Applied Chemistry, Harbin Institute Technology, Harbin, 150001, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 2885(Holographic Optical Elements and Displays), 193-195 (English) 1996. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.
AB Zn, Fe: **LiNbO3** crystal, with fine photorefractive properties, has been grown by **Czochralski** technique. Its response time was measured to be about tens seconds, the diffraction efficiency to be higher than 70%, Employing Zn, Fe: **LiNbO3** as a holog. record media, another photorefractive crystal Cu: KNSBN as a self-pump phase conjugate mirror, the double-exposure interferometry has been studied in this paper.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(photorefractive **Zn,Fe-doped** **LiNbO3** crystal for real-time double-exposure interferometry application)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 75
IT Holographic interferometry
Holographic memory devices
Holographic recording materials
(photorefractive **Zn,Fe-doped** **LiNbO3** crystal for real-time double-exposure interferometry application)
IT 7439-89-6, Iron, uses 7440-66-6, Zinc, uses
(photorefractive **Zn,Fe-doped** **LiNbO3** crystal for real-time double-exposure interferometry application)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(photorefractive **Zn,Fe-doped** **LiNbO3** crystal for real-time double-exposure interferometry application)

L63 ANSWER 12 OF 12 HCA COPYRIGHT 2003 ACS on STN

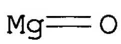
116:12786 Study on second-harmonic generation in magnesium + titanium doped lithium niobate single crystals. Zhou, Yewei; Zheng, Chuanxiang; Xie, Jian; Wang, Xiu; Xu, Guanfeng (Dep. Optoelectron., Sichuan Univ., Chengdu, 610064, Peop. Rep. China). Physica Status Solidi A: Applied Research, 127(2), K147-K150 (English) 1991. CODEN: PSSABA. ISSN: 0031-8965.

AB Exptl. results are reported on non-crit. phase matching temps. and the 2nd-harmonic generation efficiencies in **LiNbO3** (LN) single crystals **double-doped** with **MgO** and TiO2 (LN:Mg + Ti), which were recently grown by a modified **Czochralski** method and had good optical homogeneity. Conversion efficiencies for the doubling of the 1064 nm radiation frequency in LN: Mg + Ti crystals are larger than that of LN and LN: Mg crystals.

IT **1309-48-4**, **Magnesium oxide**, properties
(second-harmonic generation in lithium niobate doped with, with and without titania)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(second-harmonic generation in magnesia-titania-doped)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75

IT **1309-48-4**, **Magnesium oxide**, properties
(second-harmonic generation in lithium niobate doped with, with and without titania)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(second-harmonic generation in magnesia-titania-doped)

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L64 ANSWER 1 OF 47 HCA COPYRIGHT 2003 ACS on STN

136:109624 Control of the photorefractive two-wave mixing in **LiNbO3**:Fe and **LiNbO3**:Fe:In with an incoherent background beam. Zhao, Hong-E.; Liu, Si-Min; Guo, Ru; Jiang, Ying; Li, Fei-Fei; Chen, Xiao-Hu; Wang, Da-Yun; Wen, Hai-Dong; Xu, Jing-Jun (College of Physics, Nankai University, Tianjin, 300071, Peop. Rep. China). Wuli Xuebao, 50(11), 2149-2154 (Chinese) 2001. CODEN: WLHPAR. ISSN: 1000-3290. Publisher: Zhongguo Kexueyuan Wuli Yanjiuso.

AB The results were analyzed of the photorefractive 2-wave mixing in **LiNbO3**:Fe and **LiNbO3**:Fe:In controlled by an incoherent beam, and related expts. were performed. The incoherent

beam can effectively control the photorefractive 2-wave coupling gain in a large range, suppress the fanning effect, increase the signal-to-noise ratio, and shorten the setup time of the 2-wave mixing grating.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(control with incoherent background beam of photorefractive two-wave mixing in iron-doped with and without indium)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST photorefractive two wave mixing **indium iron doped** lithium niobate

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(control with incoherent background beam of photorefractive two-wave mixing in iron-doped with and without indium)

L64 ANSWER 2 OF 47 HCA COPYRIGHT 2003 ACS on STN

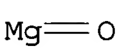
135:233548 Nonreciprocal transmission in a direct-bonded photorefractive Fe:**LiNbO3** buried waveguide. Gawith, Corin B. E.; Hua, Ping; Smith, Peter G. R.; Cook, Gary (Optoelectronics Research Centre, University of Southampton, Southampton, SO17 1BJ, UK). Applied Physics Letters, 78(26), 4106-4108 (English) 2001. CODEN: APPLAB. ISSN: 0003-6951. Publisher: American Institute of Physics.

AB The authors report the fabrication of a 20-.mu.m-thick photorefractive Fe:**LiNbO3** planar waveguide buried in **MgO**:**LiNbO3** by direct bonding of precision polished surfaces. Nonreciprocal transmission measurements were performed in a 3-mm-long device with a continuous wave 532 nm frequency-doubled YAG laser source. A Fresnel-reflection-based counterpropagating beam arrangement was used to measure a relative change in absorbance of .apprx.2 within the waveguide, with a photorefractive response time of 4.9 ms.

IT **1309-48-4**, **Magnesium oxide**, uses
(**LiNbO3 doped** with; nonreciprocal transmission in a direct-bonded photorefractive Fe:**LiNbO3** buried waveguide)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(iron-**doped** and **magnesium oxide-doped**; nonreciprocal transmission in a direct-bonded photorefractive Fe:**LiNbO3** buried waveguide)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related

Properties)
ST photorefractive planar waveguide lithium niobate **iron magnesium oxide**
IT Planar waveguides (optical)
(nonreciprocal transmission in a direct-bonded photorefractive Fe:**LiNbO3** buried waveguide)
IT **1309-48-4**, **Magnesium oxide**, uses
7439-89-6, Iron, uses
(**LiNbO3 doped** with; nonreciprocal transmission in a direct-bonded photorefractive Fe:**LiNbO3** buried waveguide)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(iron-**doped** and **magnesium oxide-doped**; nonreciprocal transmission in a direct-bonded photorefractive Fe:**LiNbO3** buried waveguide)

L64 ANSWER 3 OF 47 HCA COPYRIGHT 2003 ACS on STN
135:160093 The role of carrier mobility in holographic recording in **LiNbO3**. Adibi, A.; Buse, K.; Psaltis, D. (School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, 30332, USA). Applied Physics B: Lasers and Optics, 72(6), 653-659 (English) 2001. CODEN: APBOEM. ISSN: 0946-2171. Publisher: Springer-Verlag.
AB The role of carrier mobility in holog. recording in **LiNbO3** crystals was investigated. Both normal holog. recording (single wavelength, single trap) and two-center recording are considered, and the differences between the performances of the two methods are explained. It was shown that increasing mobility by using stoichiometric crystals or by doping with Mg does not improve sensitivity considerably, but does reduce dynamic range (M/#) by at least one order of magnitude.
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(role of carrier mobility in holog. recording in lithium niobium oxide crystals doped with different metal ions)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
ST electron mobility role holog recording lithium niobium oxide crystal; lithium niobium oxide **iron magnesium** manganese **doped** holog recording; carrier mobility holog recording sensitivity doped lithium niobium oxide
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(role of carrier mobility in holog. recording in lithium niobium oxide crystals doped with different metal ions)

L64 ANSWER 4 OF 47 HCA COPYRIGHT 2003 ACS on STN
134:334175 Experimental study of nonvolatile holographic storage of multiply **doped** lithium niobate crystals. Liu, Youwen; Liu, Liren R.; Zhou, Changhe; Xu, Liangying (Shanghai Institute of Optics and Fine Mechanics, Chinese Academy Sciences, Shanghai,

201800, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 4110(Photorefractive Fiber and Crystal Devices: Materials, Optical Properties, and Applications VI), 64-71 (English) 2000. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.

AB Four kinds of lithium niobate crystals **doped** with Cu:Ce, Mn:Cu:Ce, Mn:Fe, and Mn:**Fe**:**Mg** processed under oxidn. or redn. conditions are studied exptl. for the photorefractive non-volatile holog. storage with the first scheme, i.e with UV light sensitizing and red light recording. On the condition of non-volatile holog. storage with high signal-to-noise ratio, the non-volatile diffraction efficiency of the oxidized **LiNbO3**:Cu:Ce crystal is the highest among all studied samples. The non-volatile holog. storage in the oxidized **LiNbO3**:Cu:Ce crystal is performed with the second scheme, i.e with blue light sensitizing and red light recording, and the intensity of the blue light is optimized.

IT **1309-48-4**, **Magnesium oxide**, uses
(nonvolatile holog. storage in multiply **doped** lithium niobate crystals)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(nonvolatile holog. storage in multiply **doped** lithium niobate crystals)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST nonvolatile holog storage multiply **doped** lithium niobate crystal

IT Holographic memory devices
Holographic recording materials
Photorefractive effect
Refractive index
(nonvolatile holog. storage in multiply **doped** lithium niobate crystals)

IT 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses 7439-96-5, Manganese, uses 7440-45-1, Cerium, uses 7440-50-8, Copper, uses
(nonvolatile holog. storage in multiply **doped** lithium niobate crystals)

IT 1309-37-1, Iron oxide(Fe2O3), uses **1309-48-4**, **Magnesium oxide**, uses 1317-38-0, Copper monoxide, uses 1344-43-0, Manganese monoxide, uses 1345-13-7, Cerium oxide(Ce2O3)
(nonvolatile holog. storage in multiply **dop d** lithium niobate crystals)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(nonvolatile holog. storage in multiply **doped** lithium niobate crystals)

L64 ANSWER 5 OF 47 HCA COPYRIGHT 2003 ACS on STN
134:318330 Temporal evolution of beam fanning in **LiNbO3**:Fe,In crystals. Zhang, Xinzheng; Xu, Jingjun; Liu, Simin; Huang, Hui; Wolfsberger, Johann; Chen, Xiaohu; Zhang, Guangyin (Photonics Research Center, Nankai University, Tianjin, 300071, Peop. Rep. China). Applied Optics, 40(5), 683-686 (English) 2001. CODEN: APOPAI. ISSN: 0003-6935. Publisher: Optical Society of America.

AB The authors studied the temporal evolution of light-induced scattering in **LiNbO3**:Fe,In crystals with different doping concns. A special behavior of the beam fanning was found when the intensity of the incident light was relatively weak. In this case the beam fanning became stronger at the beginning of the illumination and then was greatly reduced, which was obsd. only at strong incident light intensities. This phenomenon was analyzed from the satn. space-charge field. The intensity threshold effect and the concn. threshold effect were successfully explained.

IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(temporal evolution of beam fanning in **LiNbO3**:Fe,In crystals)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST beam fanning **LiNbO3 iron indium doping**

IT Optical properties
(beam fanning; temporal evolution of beam fanning in **LiNbO3**:Fe,In crystals)

IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(temporal evolution of beam fanning in **LiNbO3**:Fe,In crystals)

IT 7439-89-6, Iron, uses 7440-74-6, Indium, uses
(temporal evolution of beam fanning in **LiNbO3**:Fe,In crystals)

L64 ANSWER 6 OF 47 HCA COPYRIGHT 2003 ACS on STN
134:258667 Yb3+ distribution in **LiNbO3**:(**MgO**) studied by cooperative luminescence. Montoya, E.; Bausa, L. E.; Schaudel, B.; Goldner, P. (Departamento Fisica de Materiales, C-IV, Facultad de Ciencias, Universidad Autonoma de Madrid, Cantoblanco, Madrid, 28049, Spain). Journal of Chemical Physics, 114(7), 3200-3207 (English) 2001. CODEN: JCPSA6. ISSN: 0021-9606. Publisher: American Institute of Physics.

AB This work presents a study of the distribution of Yb3+ ions in **LiNbO3** and **LiNbO3**:**MgO** using cooperative luminescence as a probe. The cooperative rate is measured as a function of Yb3+ concn. in the samples. After comparing the exptl.

results with simple possibilities for rare earth distribution, a model for the distribution of Yb3+ ions is proposed, in which a fraction of the **dopant** ions forms **pairs** with an Yb3+ ion placed at Li+ site and the other one at Nb5+ site, while the rest of the ions are randomly placed at Li+ sites. Also, the codoping with **MgO** enhances the cooperative emission and this is discussed in terms of a more efficient redistribution of Yb3+ ions to Nb5+ sites.

IT **1309-48-4**, **Magnesium oxide**, properties
(Yb3+ distribution in **LiNbO3**:(**MgO**) studied by cooperative luminescence)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg═O

IT **12031-63-9**, Lithium niobate **LiNbO3**
(Yb3+ distribution in **LiNbO3**:(**MgO**) studied by cooperative luminescence)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST ytterbium distribution lithium niobate **magnesium oxide** doped cooperative photoluminescence

IT Luminescence
(Yb3+ distribution in **LiNbO3**:(**MgO**) studied by cooperative luminescence)

IT **1309-48-4**, **Magnesium oxide**, properties
7440-64-4, Ytterbium, properties 18923-27-8, Ytterbium(3+), properties
(Yb3+ distribution in **LiNbO3**:(**MgO**) studied by cooperative luminescence)

IT **12031-63-9**, Lithium niobate **LiNbO3**
(Yb3+ distribution in **LiNbO3**:(**MgO**) studied by cooperative luminescence)

L64 ANSWER 7 OF 47 HCA COPYRIGHT 2003 ACS on STN

134:78294 Study of the self-defocusing in **LiNbO3**:Fe,Mg crystals. Kamber, N. Y.; Zhang, G.; Liu, S.; Mikha, S. M.; Haidong, W. (College of Physics Science, Photonics Research Center, Nankai University, Tianjin, 300071, Peop. Rep. China). Optics Communications, 184(5,6), 475-483 (English) 2000. CODEN: OPCOB8. ISSN: 0030-4018. Publisher: Elsevier Science B.V..

AB The authors present an exptl. study of the photorefractive self-defocusing in **LiNbO3**:Fe,Mg crystals which is investigated by using the Z-scan technique. The self-defocusing effect appears weak in **LiNbO3**:Fe,Mg crystals as opposed to **LiNbO3**:Fe crystals. The exptl. results show that self-defocusing is due to the photorefractive lens-like effect. The

holog. recording and two-wave mixing are investigated in order to explain this effect in **LiNbO3**:Fe,Mg crystals. The authors describe the principle and application of Z-scan technique, and analyze the single wavelength Z-scan measurements of the nonlinear absorption coeff. and the nonlinear refractive index and its sign of the samples **LiNbO3**:Fe and **LiNbO3**:Fe,Mg.

IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(photorefractive self-defocusing in Fe-**doped** and **Fe**,**Mg**-codoped **LiNbO3** crystals)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST nonlinear selfdefocusing lithium niobium oxide **iron magnesium doped** crystal; defocusing lithium niobate **iron magnesium doped** crystal

IT Nonlinear optical absorption
(nonlinear absorption coeffs. for Fe-**doped** and **Fe**,**Mg**-codoped **LiNbO3** crystals)

IT Refractive index
(nonlinear; of Fe-**doped** and **Fe**,**Mg** -codoped **LiNbO3** crystals)

IT Nonlinear optical materials
Two wave mixing
(photorefractive self-defocusing in Fe-**doped** and **Fe**,**Mg**-codoped **LiNbO3** crystals)

IT Nonlinear optical properties
(self-defocusing; photorefractive self-defocusing in Fe-**doped** and **Fe**,**Mg**-codoped **LiNbO3** crystals)

IT Laser radiation transmission
(transmitted laser beam spots for Fe-**doped** and **Fe**,**Mg**-codoped **LiNbO3** crystals)

IT 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties
(dopant; photorefractive self-defocusing in Fe-**doped** and **Fe**,**Mg**-codoped **LiNbO3** crystals)

IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(photorefractive self-defocusing in Fe-**doped** and **Fe**,**Mg**-codoped **LiNbO3** crystals)

L64 ANSWER 8 OF 47 HCA COPYRIGHT 2003 ACS on STN

134:48862 Self frequency **doubling** Yb3+,**MgO doped** periodically poled **LiNbO3**. Montoya, E.; Capmany, J.; Callejo, D.; Bermudez, V.; Dieguez, E.; Bausa, L. E. (Departamento de Fisica de Materiales, C-IV Universidad Autonoma de Madrid, Madrid, 28049, Spain). OSA Trends in Optics and Photonics Series, 34(Advanced Solid State Lasers), 342-344 (English) 2000. CODEN: OTOPFZ. ISSN: 1094-5695. Publisher: Optical Society of America.

AB Self-frequency doubled laser action was obtained in Yb3+:**MgO** doped periodically poled doped **LiNbO3** with 58 mW of IR

power and 10.5 mW of green power.
IT **1309-48-4**, **Magnesium oxide**, properties
(self frequency **doubling** Yb3+,**MgO**
doped periodically poled **LiNbO3**)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

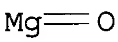
IT **12031-63-9**, Lithium niobate **LiNbO3**
(self frequency **doubling** Yb3+,**MgO**
doped periodically poled **LiNbO3**)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST frequency doubling ytterbium **magnesium oxide** doped PPLN; periodically poled lithium niobate nonlinear property
IT Nonlinear optical properties
Second-harmonic generation
(self frequency **doubling** Yb3+,**MgO**
doped periodically poled **LiNbO3**)
IT **1309-48-4**, **Magnesium oxide**, properties
7440-64-4, Ytterbium, properties 18923-27-8, Ytterbium(3+), properties
(self frequency **doubling** Yb3+,**MgO**
doped periodically poled **LiNbO3**)
IT **12031-63-9**, Lithium niobate **LiNbO3**
(self frequency **doubling** Yb3+,**MgO**
doped periodically poled **LiNbO3**)

L64 ANSWER 9 OF 47 HCA COPYRIGHT 2003 ACS on STN
132:214486 Self-frequency **doubling** in Yb3+ **doped** periodically poled **LiNbO3:MgO** bulk crystal.
Capmany, J.; Montoya, E.; Bermudez, V.; Callejo, D.; Dieguez, E.; Bausa, L. E. (Departmento de Fisica de Materiales, Universidad Autonoma de Madrid, Madrid, 28049, Spain). Applied Physics Letters, 76(11), 1374-1376 (English) 2000. CODEN: APPLAB. ISSN: 0003-6951. Publisher: American Institute of Physics.
AB Continuous-wave laser action from an Yb3+ doped periodically poled **LiNbO3:MgO** bulk crystal at 1.06 .mu.m is reported. Efficient and stable self-frequency-doubled laser action at 531 nm was obtained by quasiphase matching. Up to 10.5 mW of green output power is obtained from a total laser output power of 58 mW. The expts. were carried out by end pumping with a Ti:sapphire laser, as a surrogate source for a diode laser, at 980 nm. Laser operation was stable at room temp. The results are compared with those corresponding to single-domain Yb-doped crystals.
IT **1309-48-4**, **Magnesium oxide** (**MgO**
), properties

(self-frequency doubling in ytterbium- and magnesia-doped periodically poled lithium niobate bulk crystal)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(self-frequency doubling in ytterbium- and magnesia-doped periodically poled lithium niobate bulk crystal)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT **1309-48-4**, **Magnesium oxide** (**MgO**), properties 7440-64-4, Ytterbium, properties 18923-27-8, Ytterbium(3+), properties
(self-frequency doubling in ytterbium- and magnesia-doped periodically poled lithium niobate bulk crystal)

IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(self-frequency doubling in ytterbium- and magnesia-doped periodically poled lithium niobate bulk crystal)

L64 ANSWER 10 OF 47 HCA COPYRIGHT 2003 ACS on STN

132:184120 Manufacture of ceramic-metal laminates or composites by coating of metal substrates with ceramic layers using organometal precursors. Derochemont, Pierre L.; Ryder, Daniel E.; Suscavage, Michael J.; Klugerman, Mikhail (The United States of America as Represented by the Secretary of the Air Forc, USA). U.S. US 6027826 A 20000222, 30 pp., Cont.-in-part of U.S. Ser. No. 263,207, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1995-538264 19951002. PRIORITY: US 1994-263207 19940616.

AB Metal substrates are preheated, and then sprayed with an organometal in a solvent for pyrolysis to deposit a ceramic layer of porous and/or amorphous metal oxide without intermediate bonding layers, preferably followed by pressing the porous ceramic for densification and a partial crystn. The organometal salts are typically based on carboxylic acids reacted with heavy metals and alk.-earth metals. The metal substrate is typically preheated to a temp. above the b.p. of org. solvent, and high enough to initiate thermal decompn. of the organometal salt without a liq.-coating stage. The process is suitable for deposition of ceramic layer >1.5 .mu.m thick on metal strip, tube, wire, or filament, esp. to form an outer ceramic tube having c-axis orientation. The ceramic film is a porous amorphous oxide, and can be processed to a dense amorphous ceramic by mech. compression, and/or heat treated for crystn. of the amorphous layer. The metal-ceramic laminates can be pressed to manuf. multilayered composites. The process is suitable for deposition of complex ceramic oxides of superconducting, piezoelec., or elec. insulating types, esp. for the manuf. of electromagnetic or heat shields as

well as elec. conductors. The deposited ceramic is optionally Bi-Sr-Ca-Cu oxide, esp. as the Bi2Sr2Ca2Cu3O10 with the compn. controlled for elec. supercond.

IT **1312-43-2**, **Indium trioxide**
12031-63-9, Lithium niobium oxide (**LiNbO3**)
(ceramic, coating with; ceramic-metal laminates or composites manufd. by coating of metal substrate with oxide ceramic from organometal precursor)

RN 1312-43-2 HCA
CN Indium oxide (In2O3) (6CI, 8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IC ICM B32B015-04
ICS B32B018-00; H01B012-00; H01L039-00
NCL 428702000
CC 56-4 (Nonferrous Metals and Alloys)
Section cross-reference(s): 57, 76

IT **1312-43-2**, **Indium trioxide** 12004-04-5, Aluminum barium oxide (BaAl2O4) 12004-37-4, Aluminum strontium oxide (SrAl2O4) 12030-85-2, Potassium niobate (KNbO3)
12031-63-9, Lithium niobium oxide (**LiNbO3**)
12034-09-2, Sodium niobate (NaNbO3) 12042-68-1, Aluminum calcium oxide (CaAl2O4) 12068-51-8, Aluminum **magnesium oxide** (MgAl2O4) 12068-86-9, **Iron magnesium oxide** (Fe2MgO4) 12143-46-3, Tin **zinc oxide** (SnZn2O4) 52935-30-5, Magnesium yttrium oxide (MgY2O4)
(ceramic, coating with; ceramic-metal laminates or composites manufd. by coating of metal substrate with oxide ceramic from organometal precursor)

IT 114901-61-0, Bismuth calcium copper strontium oxide 115866-34-7D, Bismuth calcium copper strontium oxide (Bi2CaCu2Sr2O8), Pb-**doped** 116224-72-7D, Bismuth calcium copper strontium oxide (Bi2Ca2Cu3Sr2O10), Pb-**doped**
(coating with; ceramic-metal laminates or composites manufd. by coating of metal substrate with oxide ceramic from organometal precursor)

L64 ANSWER 11 OF 47 HCA COPYRIGHT 2003 ACS on STN

131:304722 Luminescence of **LiNbO3**:**MgO**,Cr crystals under high pressure. Kaminska, A.; Dmochowski, J. E.; Suchocki, A.; Garcia-Sole, J.; Jaque, F.; Arizmendi, L. (Institute of Physics, Polish Academy of Sciences, Warsaw, 02-668, Pol.). Physical Review B: Condensed Matter and Materials Physics, 60(11), 7707-7710 (English) 1999. CODEN: PRBMDO. ISSN: 0163-1829. Publisher: American Physical Society.

AB The results of high-pressure studies of **LiNbO3**:Cr(0.2%), Mg crystals **doped** with **two** concns. of Mg (2% and 5.5%) are reported. The results reveal information about the electronic structure of different Cr3+ centers in Li niobate

crystals. There are three major Cr3+ centers (denoted by .alpha., .beta., and .gamma.) in the crystal with 2% of Mg. These centers correspond to Cr3+ ions in Li+ sites with different crystal field. At ambient pressure the .alpha. center experiences strong crystal field and the .beta. and .gamma. centers are the intermediate crystal-field centers. The energy differences between the 4T2 and 2E levels are pos. and neg. for the .beta. and the .gamma. centers, resp. Addnl. broadband luminescence obsd. in the sample with 5.5% of Mg even at pressure of almost 100 kbar testifies that another very weak crystal-field center exists in this crystal. This center (denoted by .delta.) corresponds to Cr3+ ions located in Nb5+ sites. The R lines of the Cr3+ centers exhibit very large red shift with pressure of .apprx.3 cm-1/kbar.

IT **1309-48-4**, **Magnesium oxide**, uses
(luminescence of **LiNbO3**:**MgO**,Cr crystals under high pressure)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

IT **12031-63-9**, Lithium niobate **LiNbO3**
(luminescence of **LiNbO3**:**MgO**,Cr crystals under high pressure)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST luminescence lithium niobate chromium **magnesium oxide** doped; electronic structure impurity center piezoluminescence
IT Piezooptical properties
Piezooptical properties
(deformation luminescence; luminescence of **LiNbO3**:**MgO**,Cr crystals under high pressure)
IT Luminescence
Luminescence
(deformation; luminescence of **LiNbO3**:**MgO**,Cr crystals under high pressure)
IT Crystal field
Crystal impurities
Electronic structure
Luminescence
(luminescence of **LiNbO3**:**MgO**,Cr crystals under high pressure)
IT **1309-48-4**, **Magnesium oxide**, uses
(luminescence of **LiNbO3**:**MgO**,Cr crystals under high pressure)
IT 7439-95-4, Magnesium, properties 7440-47-3, Chromium, properties 16065-83-1, Chromium(3+), properties

(luminescence of **LiNbO3:MgO**,Cr crystals under
high pressure)
IT **12031-63-9**, Lithium niobate **LiNbO3**
(luminescence of **LiNbO3:MgO**,Cr crystals under
high pressure)

L64 ANSWER 12 OF 47 HCA COPYRIGHT 2003 ACS on STN
131:293688 Electron trapping centers and cross sections in
LiNbO3 studied by 57Co Mossbauer emission spectroscopy.
Becze-Deak, T.; Bottyan, L.; Corradi, G.; Korecz, L.; Nagy, D. L.;
Polgar, K.; Sayed, S.; Spiering, H. (KFKI Research Institute for
Particle and Nuclear Physics, Budapest, H-1525, Hung.). Journal of
Physics: Condensed Matter, 11(32), 6239-6250 (English) 1999. CODEN:
JCOMEL. ISSN: 0953-8984. Publisher: Institute of Physics
Publishing.
AB Fast electron trapping processes and aliovalent charge states
following the 57Co(EC)57Fe decay were studied in undoped, 5.4 mol%
Mg-doped and 0.1 mol% Fe-doped **LiNbO3** in various
thermochem. redn. (TCR) states. Static 57Co Mossbauer emission
spectra of congruent Mg:**LiNbO3** recorded at T = 4.2 K in
external magnetic field of 4.6 T are presented. Trapping cross
section ratios are derived for FeLi3+, NbLi5+ and MgLi2+. A method
to det. trap concns. for TCR states of **LiNbO3** is outlined.
The electron-capture distance of the traps is 2.7 .+-. 1.4 nm. As
this is much smaller than the 6 keV Auger-electron penetration
depth, the distribution of the aliovalent charge states at 4.2 K is
detd. mainly by the 600 eV Auger electrons.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(electron trapping centers and cross sections in doped
LiNbO3)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 76-1 (Electric Phenomena)
ST electron trap **magnesium iron doped**
lithium niobate
IT Dopants
Electron traps
Trapping
Valence
(electron trapping centers and cross sections in doped
LiNbO3)
IT Reduction
(thermal; electron trapping centers and cross sections in doped
LiNbO3 after)
IT 20074-52-6, Iron(3+), properties 22537-22-0, Magnesium(2+),
properties 22537-41-3, Niobium(5+), properties
(electron trapping centers and cross sections in doped
LiNbO3)
IT 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses
(electron trapping centers and cross sections in doped
LiNbO3)

IT 128812-86-2P, Lithium magnesium niobium oxide
(electron trapping centers and cross sections in doped
LiNbO3)

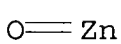
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(electron trapping centers and cross sections in doped
LiNbO3)

L64 ANSWER 13 OF 47 HCA COPYRIGHT 2003 ACS on STN
131:11102 Continuous wave laser radiation and self-frequency-**doubling** in **ZnO doped LiNbO3**
:Nd3+. Capmany, J.; Jaque, D.; Sanz Garcia, J. A.; Garcia Sole, J. (Departamento Fisica de Materiales C-IV, Universidad Autonoma de Madrid, Madrid, 28049, Spain). Optics Communications, 161(4,5,6), 253-256 (English) 1999. CODEN: OPCOB8. ISSN: 0030-4018. Publisher: Elsevier Science B.V..

AB The authors report on continuous wave stable laser action and self-frequency-doubling at room temp. in the system **LiNbO3** :Nd3+, codoped with **ZnO** to avoid photorefractive damage effects. The main parameters related to IR laser action in this system are discussed and the optical quality of the crystals was studied by measuring the optical losses due to scattering in laser expts.

IT **1314-13-2**, **Zinc oxide** (**ZnO**), properties
(continuous wave laser radiation and self-frequency-**doubling** in **ZnO doped LiNbO3**
:Nd3+)

RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate **linbo3**
(continuous wave laser radiation and self-frequency-**doubling** in **ZnO doped LiNbO3**
:Nd3+)

RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

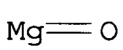
ST continuous wave laser radiation frequency doubling; **zinc oxide** neodymium doped lithium niobate laser

IT IR laser radiation
Second-harmonic generation
(continuous wave laser radiation and self-frequency-**doubling** in **ZnO doped LiNbO3**
:Nd3+)

IT IR lasers
(scattering losses; continuous wave laser radiation and self-frequency-**doubling** in **ZnO doped**

LiNbO3:Nd3+)
IT **1314-13-2**, **Zinc oxide** (**ZnO**),
properties 14913-52-1, Neodymium(3+), properties
(continuous wave laser radiation and self-frequency-
doubling in **ZnO** **doped** **LiNbO3**
:Nd3+)
IT **12031-63-9**, Lithium niobate **linbo3**
(continuous wave laser radiation and self-frequency-
doubling in **ZnO** **doped** **LiNbO3**
:Nd3+)

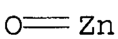
L64 ANSWER 14 OF 47 HCA COPYRIGHT 2003 ACS on STN
130:318325 Two-wave mixing in Ce:BaTiO3, **MgO**:**LiNbO3**
and Fe:**LiNbO3** crystals. Joo, Won Je; Park, Joo Hyoung;
Kwak, Jang Man; Oh, Cha Hwan; Song, Seok Ho; Han, Yong Kyu; Kim,
Pill Soo (Department of Physics, Hanyang University, Seoul, 133-791,
S. Korea). Han'guk Kwanghak Hoechi, 9(6), 423-427 (Korean) 1998.
CODEN: HKHOEQ. ISSN: 1225-6285. Publisher: Optical Society of
Korea.
AB Two wave mixing expts. in **LiNbO3**, BaTiO3 are carried out,
and the characteristics as optical information processing device are
investigated. Examd. crystals are commonly used ones, such as 0.03%
mol. Ce-doped BaTiO3, 0.03% mol. Fe-doped **LiNbO3** and 6%
mol. **MgO**-doped **LiNbO3**. Ar+ laser is used as the
writing beam, and He-Ne Laser is used as the reading beam. The
recording-decay and erasing characteristics of diffraction gratings,
the time consts., and the angular selectivities are measured for
each crystals and compared.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(iron- or **magnesium** **oxide**-**doped**;
two-wave mixing in crystals of)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **1309-48-4**, **Magnesium** **oxide**, uses
(two wave mixing in lithium niobate crystal doped with)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 74, 75
IT Two wave mixing
(in cerium doped barium titanate and **magnesium**
oxide doped lithium niobate and iron doped lithium
niobate crystals)
IT 12047-27-7, Barium titanate (BaTiO3), properties
(cerium-**doped**; **two**-wave mixing in crystals
of)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
   (iron- or **magnesium oxide-doped**;
   two-wave mixing in crystals of)
IT **1309-48-4**, **Magnesium oxide**, uses
   7439-89-6, Iron, uses
   (two wave mixing in lithium niobate crystal doped with)

L64 ANSWER 15 OF 47 HCA COPYRIGHT 2003 ACS on STN
129:337527 Holographic storage properties of **Zn**:**Fe**:
   LiNbO3 crystal. Xu, Yanling; Yang, Chunhui; Xu, Yuheng;
   Zhao, Yequan; Xu, Wusheng (Department of Applied Chemistry, Harbin
   Institute of Technology, Harbin, 150001, Peop. Rep. China).
   Gaojishu Tongxun, 8(6), 39-42 (Chinese) 1998. CODEN: GTONE8. ISSN:
   1002-0470. Publisher: Gaojishu Tongxun Zazhishe.
AB **LiNbO3** was **doped** with **ZnO** and Fe2O3 to
   grow **Zn**:**Fe**:**LiNbO3** crystal. The
   absorption spectrum, IR transmission spectrum, light scattering
   resistance, diffraction efficiency, response time and storage
   conservative time were measured. Its holog. storage mechanism was
   studied.
IT **1314-13-2**, **Zinc oxide** (**ZnO**),
   properties
   (holog. storage property of **Zn**:**Fe**:
   LiNbO3 crystal)
RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate (**LiNbO3**)
   (holog. storage property of **Zn**:**Fe**:
   LiNbO3 crystal)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and
   Other Reprographic Processes)
   Section cross-reference(s): 75
ST lithium niobate **doping** crystal holog storage; **zinc**
   iron doped lithium niobate crystal
IT Optical diffraction
   (efficiency; holog. storage property of **Zn**:**Fe**
   :**LiNbO3** crystal)
IT Absorption spectra
   Crystals
   Holography
   (holog. storage property of **Zn**:**Fe**:
   LiNbO3 crystal)
IT Light scattering
   (resistance; holog. storage property of **Zn**:**Fe**
   :**LiNbO3** crystal)

IT IR spectra
(transmission; holog. storage property of **Zn**:**Fe**
:**LiNbO3** crystal)
IT 1309-37-1, Ferric oxide, properties **1314-13-2**,
Zinc oxide (**ZnO**), properties
(holog. storage property of **Zn**:**Fe**:
LiNbO3 crystal)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. storage property of **Zn**:**Fe**:
LiNbO3 crystal)

L64 ANSWER 16 OF 47 HCA COPYRIGHT 2003 ACS on STN
129:35502 Electron paramagnetic resonance study of Fe3+ in
LiNbO3:Mg:Fe crystal. Yeom, T. H.; Lee, S. H.; Choh, S. H.;
Choi, D. (Department of Physics, Chongju University, Chongju,
360-764, S. Korea). Journal of the Korean Physical Society,
32(Suppl., Proceedings of the 9th International Meeting on
Ferroelectricity, 1997, Pt. 2), S647-S649 (English) 1998. CODEN:
JKPSDV. ISSN: 0374-4884. Publisher: Korean Physical Society.
AB The rotation patterns of the EPR spectra for the Fe3+ impurity in a
LiNbO3:Mg:Fe single crystal were obtained in three mutually
perpendicular planes. Three Fe3+ centers were identified in
LiNbO3:Mg(5 mol%) codoped with 0.05 mol% Fe. Probably the
Fe3+(I) and Fe3+(II) centers, showing C3 local site symmetry, are
due to the Fe3+ ions substituting for the Li+ and Nb5+ sites, resp.
Also, these Fe3+ centers occupy different cation sites in pairs to
keep the charge equil. The Fe3+(III) center, which shows no C3
local site symmetry, can be originated from the Fe3+ - V0 complex.
IT **12031-63-9**, Lithium niobate
(ESR study of Fe3+ in **LiNbO3**:Mg:Fe crystal)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 77-6 (Magnetic Phenomena)
ST ESR **iron magnesium doped** lithium
niobate
IT Crystal structure
ESR (electron spin resonance)
Paramagnetic centers
(ESR study of Fe3+ in **LiNbO3**:Mg:Fe crystal)
IT Crystal structure-property relationship
(ESR; ESR study of Fe3+ in **LiNbO3**:Mg:Fe crystal)
IT 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses
(ESR study of Fe3+ in **LiNbO3**:Mg:Fe crystal)
IT **12031-63-9**, Lithium niobate 20074-52-6, Iron(3+),
properties
(ESR study of Fe3+ in **LiNbO3**:Mg:Fe crystal)

L64 ANSWER 17 OF 47 HCA COPYRIGHT 2003 ACS on STN
128:250048 Recombination processes in **LiNbO3** crystals.
Blistanov, A. A.; Lyubchenko, V. M.; Goryunova, A. N. (Mosk. Inst.
Stali Splavov, Russia). Kristallografiya, 43(1), 86-91 (Russian)

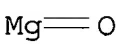
1998. CODEN: KRISAJ. ISSN: 0023-4761. Publisher: MAIK Nauka.

AB Using cathodoluminescence and thermoluminescence measurements of **LiNbO3**, both undoped and **doped** with Fe and Mg impurities, the possibility was shown of recombination luminescence of excited states with the participation of shallow levels. This process competes with the processes of charge carrier quenching by deep levels, detg. the crystal photorefraction. Since a redn. or increase in the photorefraction is possible with the assistance of this effect, not only the condition and the no. of deep levels, but also of shallow levels, can det. the recombination of excited carriers. The non-photorefractive impurity (Mg) can affect the photorefraction, not only by changing the state of the photorefractive impurity (Fe), but also by increasing the carrier recombination efficiency. A level scheme is proposed for **LiNbO3** which takes into account deep traps and shallow recombination centers.

IT **1309-48-4**, Magnesia, properties
(recombination processes in lithium niobate crystals (undoped and **doped** with magnesium and iron) with photorefraction, thermoluminescence, and cathodoluminescence)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(recombination processes in lithium niobate crystals (undoped and **doped** with magnesium and iron) with photorefraction, thermoluminescence, and cathodoluminescence)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76

ST lithium niobate **iron magnesium** recombination luminescence; photorefraction lithium niobate **iron magnesium** recombination; cathodoluminescence lithium niobate **iron magnesium** recombination; thermoluminescence lithium niobate **iron magnesium** recombination; carrier recombination lithium niobate **iron magnesium**; deep level lithium niobate recombination luminescence; shallow level lithium niobate recombination luminescence

IT Electric current carriers
(quenching; recombination processes in lithium niobate crystals (undoped and **doped** with magnesium and iron) with photorefraction, thermoluminescence, and cathodoluminescence)

IT Cathodoluminescence
Deep traps
Impurities

Photorefractive effect
Radiative recombination
Shallow traps
Thermoluminescence
(recombination processes in lithium niobate crystals (undoped and **doped** with magnesium and iron) with photorefraction, thermoluminescence, and cathodoluminescence)

IT Electric current carriers
(recombination; recombination processes in lithium niobate crystals (undoped and **doped** with magnesium and iron) with photorefraction, thermoluminescence, and cathodoluminescence)

IT 1309-37-1, Iron sesquioxide, properties **1309-48-4**, Magnesia, properties 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties
(recombination processes in lithium niobate crystals (undoped and **doped** with magnesium and iron) with photorefraction, thermoluminescence, and cathodoluminescence)

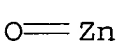
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(recombination processes in lithium niobate crystals (undoped and **doped** with magnesium and iron) with photorefraction, thermoluminescence, and cathodoluminescence)

L64 ANSWER 18 OF 47 HCA COPYRIGHT 2003 ACS on STN
128:173804 Frequency doubling properties of Zn:**LiNbO3** crystal.
Li, Minghua; Sun, Shangwen; Xu, Yuheng; Han, Aizhen (Dep. Applied Chem., Harbin Inst. Technology, Harbin, 150001, Peop. Rep. China). Guangxue Xuebao, 17(4), 430-433 (Chinese) 1997. CODEN: GUXUDC. ISSN: 0253-2239. Publisher: Kexue Chubanshe.

AB Zn:**LiNbO3** crystal was grown with doping **ZnO** into **LiNbO3**. The optical damage resistance of the Zn: **LiNbO3** was increased by 2 orders of magnitude when the **ZnO** doping concn. was >6 mol%. This value is close to that of **MgO** (> 4.6 mol%):**LiNbO3**. The frequency doubling conversion efficiency of Zn (6 mol%):**LiNbO3** was .apprx.5%, higher than that of Mg (6 mol%):**LiNbO3**. The location of Zn2+ ions and the mechanism for the increasing of optical damage resistance of Zn:**LiNbO3** are discussed.

IT **1314-13-2**, **Zinc oxide** (**ZnO**), properties
(frequency doubling and high optical damage resistance of zinc doped lithium niobate crystal)

RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(frequency doubling and high optical damage resistance of zinc doped lithium niobate crystal)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST frequency **doubling** zinc **doped** lithium niobate; laser damage zinc doped lithium niobate
IT Optical damage threshold
(increase for zinc doped lithium niobate crystal with high **ZnO** doping concn.)
IT **1314-13-2**, **Zinc oxide** (**ZnO**), properties 7440-66-6, Zinc, properties 23713-49-7, Zinc(2+), properties
(frequency doubling and high optical damage resistance of zinc doped lithium niobate crystal)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(frequency doubling and high optical damage resistance of zinc doped lithium niobate crystal)

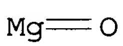
L64 ANSWER 19 OF 47 HCA COPYRIGHT 2003 ACS on STN
128:95000 Four-wave mixing of Zn:Fe:**LiNbO3** crystal. Sun, Shangwen; Li, Minghua; Pang, Zhenmin; Xu, Yuheng; Ge, Yuncheng (Dep. Astronautic-Electronic Opto-Electornic Eng., Harbin Inst. Technol., Harbin, 150001, Peop. Rep. China). Guangxue Xuebao, 17(3), 271-274 (Chinese) 1997. CODEN: GUXUDC. ISSN: 0253-2239. Publisher: Kexue Chubanshe.
AB A new **doped Zn**:**Fe**:**LiNbO3** crystal with photorefractive 4-wave mixing properties was reported. A 100% phase conjugate reflectivity was obtained. The resistance to light-induced scattering was increased, and the response was improved as compared with that of Fe:**LiNbO3**. The mechanism of such enhancement was discussed by measuring the photocond. of the crystals and analyzing the optical-damage-resistance of heavy doped Zn:**LiNbO3**.
IT **12031-63-9**, Lithium niobate
(four-wave mixing of Zn:Fe:**LiNbO3** crystal)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76
ST **zinc iron doped** lithium niobate crystal; photorefractivity photocond four wave mixing
IT Four wave mixing
Photoconductivity
Photorefractive effect
(four-wave mixing of Zn:Fe:**LiNbO3** crystal)
IT **12031-63-9**, Lithium niobate
(four-wave mixing of Zn:Fe:**LiNbO3** crystal)
IT 7439-89-6, Iron, uses 7440-66-6, Zinc, uses
(four-wave mixing of Zn:Fe:**LiNbO3** crystal)

L64 ANSWER 20 OF 47 HCA COPYRIGHT 2003 ACS on STN
125:153511 Optical absorption edge of Mg + Zn:**LiNbO3**. Yang, Xiaolong; Xu, Guanfeng; Li, Heping; Zhu, Jianguo; Wang, Xiu (Dep. Mater. Sci., Sichuan Univ., Chengdu, 610064, Peop. Rep. China). Crystal Research and Technology, 31(4), 521-527 (English) 1996. CODEN: CRTEDF. ISSN: 0232-1300. Publisher: Akademie Verlag.

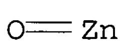
AB The optical transmittance of **LiNbO3** single crystal **double doped** with **MgO** and **ZnO** was measured from the UV to the visible range. The wavelength dependence of the absorption coeff. .alpha. and its root .alpha.1/2 (.alpha. vs. h.nu. and .alpha.1/2 vs. h.nu., resp.) were calcd. and the characteristics of the absorption edge were discussed. The energy gaps Eg and Eg' of the crystals which correspond to the direct transition and the indirect transition, resp., and the energy of phonons taking part in the indirect transition were calcd. The effects of dopants Mg and Zn on the optical absorption properties are discussed. The energy Eg' of the sample which was **double-doped** with **MgO** and **ZnO** was smaller than that of congruent **LiNbO3**, causing the indirect transition absorption edge to move towards the IR.

IT **1309-48-4**, Magnesia, properties **1314-13-2**, **Zinc oxide**, properties
(dopant in lithium niobate; UV/VIS absorption edge of Mg + Zn: **LiNbO3**)

RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate
(doped with **MgO** and **ZnO**; UV/VIS absorption edge of Mg + Zn:**LiNbO3**)

RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-4 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT Energy level transition
Phonon
(direct and phonon-mediated indirect transition energy of Mg + Zn:**LiNbO3**)

IT Optical absorption
(UV-visible, edge; of Mg + Zn:**LiNbO3**)

IT **1309-48-4**, Magnesia, properties **1314-13-2**, **Zinc oxide**, properties

(dopant in lithium niobate; UV/VIS absorption edge of Mg + Zn: **LiNbO3**)

IT **12031-63-9**, Lithium niobate
(doped with **MgO** and **ZnO**; UV/VIS absorption edge of Mg + Zn:**LiNbO3**)

L64 ANSWER 21 OF 47 HCA COPYRIGHT 2003 ACS on STN
124:327866 New cavity configurations of Nd:**MgO**:**LiNbO3** self-frequency-double lasers. Ishibashi, S.; Itoh, H.; Kaino, T.; Yokohama, I.; Kubodera, K. (Opto-electronics Lab., NTT, Atsugi, 243-01, Japan). Optics Communications, 125(1,2,3), 177-185 (English) 1996. CODEN: OPCOB8. ISSN: 0030-4018. Publisher: Elsevier.

AB Two types of self-frequency-doubled Nd:**MgO**:**LiNbO3** laser are demonstrated. Their oscillation polarization directions were controlled for 2nd harmonic generation with new cavity configurations which are smaller than the conventional cavity configuration contg. a Brewster window. The 1st laser uses an etalon effect to select the oscillation polarization direction. It emits 0.27 mW of green light (0.546 .mu.m) from a single side of the cavity in quasi continuous-wave mode when the crystal absorbs 33 mW of pump light (0.813 .mu.m) from a laser diode. The 2nd laser has a monolithic cavity and the polarization selection is achieved with angle-weak-off caused by birefringence. It emits .apprx.0.2 mW of green light in quasi continuous-wave mode when .apprx.100 mW of pump light is incident. In addn. to these expts., the effectiveness of these polarization selection methods is numerically confirmed.

IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(new cavity configurations of Nd:**MgO**:**LiNbO3** self-frequency-double lasers)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT **1309-48-4**, **Magnesium oxide** (**MgO**), uses
(new cavity configurations of Nd:**MgO**:**LiNbO3** self-frequency-double lasers)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

ST cavity configuration neodymium **doped double** laser; **magnesium oxide** lithium niobate laser

IT Lasers
(new cavity configurations of Nd:**MgO**:**LiNbO3** self-frequency-double lasers)

IT Infrared spectra
(of Nd:**MgO**:**LiNbO3**)

IT Oscillators and Resonators
(cavity, new cavity configurations of Nd:**MgO**:
LiNbO3 self-frequency-double lasers)
IT Optical nonlinear property
(second-harmonic generation, new cavity configurations of Nd:
MgO:**LiNbO3** self-frequency-double lasers)
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(new cavity configurations of Nd:**MgO**:**LiNbO3**
self-frequency-double lasers)
IT **1309-48-4**, **Magnesium oxide** (**MgO**
), uses 7440-00-8, Neodymium, uses
(new cavity configurations of Nd:**MgO**:**LiNbO3**
self-frequency-double lasers)

L64 ANSWER 22 OF 47 HCA COPYRIGHT 2003 ACS on STN
124:101691 Study on enhancement of photorefractive effect of **Mg**
:**Fe**:**LiNbO3** crystal. Li, Minghua; Wang,
Jiachang; Zhao, Yiequan; Han, Aizhen; Gao, Yuankai (Dep. Applied
Chem., Harbin Inst. Technol., Heilongjian, 150001, Peop. Rep.
China). Hongwai Yu Haomibo Xuebao, 14(5), 387-90 (Chinese) 1995.
CODEN: HHXUEZ. ISSN: 1001-9014. Publisher: Kexue.
AB With **MgO** and Fe2O3 **doped** into **LiNbO3**,
the **Mg**:**Fe**:**LiNbO3** crystal was grown.
The highest exponential gain coeff. (.GAMMA. = 80cm-1) was measured
in a thin **Mg**:**Fe**:**LiNbO3** sample, of
which the thickness was 0.2 mm. The sample showed high gain coeff.
within a wide angular range. These features were explained by the
effect of light crawling, which originated from light scattering
with large angles. The response speed and the ability of
anti-scattering of Mg:FeLiNbO3 were improved as compared with Fe:
LiNbO3. The once iteration of output in real-time holog.
associative memory was implemented by using **Mg**:**Fe**
:**LiNbO3** as a photorefractive amplifier.
IT **12031-63-9**, Lithium niobate
(photorefractive effect of iron- and magnesium-**doped**)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and
Other Reprographic Processes)
ST photorefractive effect **iron magnesium** lithium
niobate; holog **iron magnesium** lithium niobate
IT Holography
(photorefractive iron- and magnesium-**doped** lithium
niobate crystals for)
IT **12031-63-9**, Lithium niobate
(photorefractive effect of iron- and magnesium-**doped**)
IT 7439-95-4, Magnesium, properties
(photorefractive effect of lithium niobate **doped** with
iron)
IT 7439-89-6, Iron, properties
(photorefractive effect of lithium niobate **doped** with

magnesium and)

L64 ANSWER 23 OF 47 HCA COPYRIGHT 2003 ACS on STN
123:300589 Study of resistance against photorefractive light-induced scattering in **LiNbO3:Fe, Mg** crystals.
Zhang, Guangyin; Xu, Jingjun; Liu, Simin; Sun, Qian; Zhang, Guoquan; Fang, Qiyin; Ma, Chaoli (Department of Physics, Nankai University, Tianjin, 300071, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 2529, 14-17 (English) 1995. CODEN: PSISDG. ISSN: 0277-786X.
AB A new effect, the threshold effect of incident light intensity for the photorefractive light-induced scattering in **LiNbO3:** **Fe, Mg** crystals, is reported, which could be used as a simple, effective technique to suppress the photorefractively light-induced scattering and is useful to get noise-free photorefractive devices.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(resistance against photorefractive light-induced scattering in iron- and magnesium-**doped** crystals of)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **1309-48-4, Magnesium oxide**, uses
(resistance against photorefractive light-induced scattering in lithium niobate crystals **doped** with)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg═O

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75
ST photorefractive **iron magnesium** lithium niobate crystal
IT Light
(resistance against iron- and magnesium-**doped** lithium niobate crystals photorefractive scattering of)
IT Photorefractive effect
(resistance against light-induced scattering in iron- and magnesium-**doped** lithium niobate crystals caused by)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(resistance against photorefractive light-induced scattering in iron- and magnesium-**doped** crystals of)
IT **1309-48-4, Magnesium oxide**, uses
7439-89-6, Iron, uses 7439-95-4, Magnesium, uses
(resistance against photorefractive light-induced scattering in lithium niobate crystals **doped** with)

L64 ANSWER 24 OF 47 HCA COPYRIGHT 2003 ACS on STN
123:156243 Study on the holographic storage properties of **Mg:**

Fe:**LiNbO3** crystal. Li, Minghua; Wang, Jiachang; Xu, Yuheng; Liu, Jingsong; Liang, Changhong; An, Yuying (Department Applied Chemistry, Harbin Institute Technology, Harbin, 150006, Peop. Rep. China). Rengong Jingti Xuebao, 24(1), 37-40 (Chinese) 1995. CODEN: RJXUEN. ISSN: 1000-9868. Publisher: Huaxue Gongye Chubanshe.

AB **Doping MgO** and Fe2O3 into **LiNbO3**, the **Mg**:**Fe**:**LiNbO3** crystal was grown. The diffractive efficiency of **Mg**:**Fe**:**LiNbO3** crystal was measured to be 80%. The ability of anti-scattering and the response speed of **Mg**:**Fe**:**LiNbO3** crystal are higher than Fe:**LiNbO3** crystal. The real-time holog. associative memory is implemented by using **Mg**: **Fe**:**LiNbO3** crystal as a storage media.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. storage properties of **magnesium**:**iron** :lithium niobate crystal)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

ST holog **magnesium iron** lithium niobate crystal

IT Holography
(holog. storage properties of **magnesium**:**iron** :lithium niobate crystal)

IT 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses
(holog. storage properties of **magnesium**:**iron** :lithium niobate crystal)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(holog. storage properties of **magnesium**:**iron** :lithium niobate crystal)

L64 ANSWER 25 OF 47 HCA COPYRIGHT 2003 ACS on STN

123:98450 Defect structures in **LiNbO3**. Watanabe, Y.; Sota, T.; Suzuki, K.; Iyi, N.; Kitamura, K.; Kimura, S. (Dep. Electrical Eng., Waseda Univ., Tokyo, 169, Japan). Journal of Physics: Condensed Matter, 7(18), 3627-35 (English) 1995. CODEN: JCOMEL. ISSN: 0953-8984. Publisher: Institute of Physics Publishing.

AB The IR absorption bands due to the O-H bond-stretching vibration and the polarization characteristics in undoped and **MgO**-doped **LiNbO3** were examd. using well-characterized crystals. The O-H bond stretching vibrational frequency .nu.(OH) has a strong correlation with Nb concn. in the crystals. The position where H enters was detd. using Novak's empirical relation between the values of .nu.(OH) and the length of the H bond and the structure anal. data for the undoped crystals. From those results and the polarization characteristics, the intrinsic and the extrinsic defect structure models in **LiNbO3** were examd. The behavior of .nu.(OH) reflects the defect structures. The behavior of .nu.(OH) supports the Li-site vacancy model as the intrinsic defect structure model, and the corresponding extrinsic defect model. A brief

discussion is also given of the behavior of .nu.(OH) in crystals simultaneously **doped** with **two** kinds of impurity.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
136073-43-3, Lithium niobate (Li0.99NbO3)
152212-00-5, Lithium niobate (Li0.95Nb1.01O3)
153499-06-0, Lithium niobate (Li0.9Nb1.02O3)
(defect structures in)

RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

RN 136073-43-3 HCA
CN Lithium niobium oxide (Li0.99NbO3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Nb	1	7440-03-1
Li	0.99	7439-93-2

RN 152212-00-5 HCA
CN Lithium niobium oxide (Li0.95Nb1.01O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Nb	1.01	7440-03-1
Li	0.95	7439-93-2

RN 153499-06-0 HCA
CN Lithium niobium oxide (Li0.9Nb1.02O3) (9CI) (CA INDEX NAME)

Component	Ratio	Component Registry Number
O	3	17778-80-2
Nb	1.02	7440-03-1
Li	0.9	7439-93-2

CC 75-3 (Crystallography and Liquid Crystals)
Section cross-reference(s): 73

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
136073-43-3, Lithium niobate (Li0.99NbO3)
152212-00-5, Lithium niobate (Li0.95Nb1.01O3)
153499-06-0, Lithium niobate (Li0.9Nb1.02O3) 165904-08-5, Lithium magnesium niobate (Li0.95Mg0.01Nb1.01O3) 165904-09-6, Lithium magnesium niobate (Li0.92Mg0.03NbO3) 165904-10-9, Lithium magnesium niobate (Li0.9Mg0.04NbO3) 165904-11-0, Lithium magnesium niobate (Li0.87Mg0.07NbO3) 165904-12-1, Lithium magnesium niobate (Li0.92Mg0.04NbO3)
(defect structures in)

L64 ANSWER 26 OF 47 HCA COPYRIGHT 2003 ACS on STN
123:98315 Growth of doped **LiNbO3** monocrystal fibers. Wang, Xiu; Feng, Ziliang; Li, Heping; Wang, Liangsheng; Zhu, Jianguo; Jiao, Zhifeng; Xu, Xiaofei (Dep. Materials Sci., Sichuan Univ., Chengdu, Peop. Rep. China). Sichuan Daxue Xuebao, Ziran Kexueban, 32(2), 227-9 (Chinese) 1995. CODEN: SCTHAO. ISSN: 0490-6756. Publisher: Sichuan Daxue Xuebao Bianjibu.
AB The monocrystal optic fiber of doped **LiNbO3** (**LiNbO3**:Mg, **LiNbO3**:Fe, and **LiNbO3**:Mg+Ti) were prepd. by laser heating method and the phys. properties of **LiNbO3**:Mg+Ti were studied.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(growth of doped **LiNbO3** monocrystal fibers)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 75-1 (Crystallography and Liquid Crystals)
IT Optical fibers
(growth of doped **LiNbO3** monocrystal)
IT Crystal whiskers
(of lithium niobate **doped** with **magnesium**, **iron**, and magnesium+titanium)
IT Synthetic fibers
(of lithium niobate **doped** with **magnesium**, **iron**, and magnesium+titanium)
IT 7439-89-6, Iron, uses 7439-95-4, Magnesium, uses
(growth of **LiNbO3** monocrystal fibers doped with)
IT 7440-32-6, Titanium, uses
(growth of **LiNbO3** monocrystal fibers doped with magnesium and)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(growth of doped **LiNbO3** monocrystal fibers)

L64 ANSWER 27 OF 47 HCA COPYRIGHT 2003 ACS on STN
123:96920 ESA, gain and laser measurements in the Nd3+-doped nonlinear crystal LaBGeO5. Moncorge, R.; Guyot, Y.; Boulon, G.; Garcia-Sole, J.; Capmany, J.; Kaminskii, A. A.; Butashin, A. V.; Mill, B. (LPCML, Universite de Lyon I, Villeurbanne, 69622, Fr.). OSA Proc. Adv. Solid-State Lasers, Proc. Top. Meet., 25-7. Editor(s): Fan, Tso Yee; Chai, Bruce. Opt. Soc. Am.: Washington, D. C. (English) 1994. CODEN: 61APAQ.
AB In the search for new self frequency **doubling** Nd3+ **doped** laser materials, the optical properties and laser capabilities were studied of the nonlinear crystal LaBGeO5:Nd3+. This material presents interesting nonlinear and thermomech. properties and lasing lines at 1.048 and 1.071 .mu.m (4F3/2->4I11/2) and at 1.31 and 1.38 .mu.m (4F3/2->4I11/3). It shows some advantages over the recently developed **LiNbO3:MgO** :Nd3+ minilasers, such as absence of photorefractive damage, higher distribution coeff. for the Nd3+, and no domain structure. The laser line at 1.048 .mu.m appears interesting for self-frequency

doubling purposes because of its polarization properties.
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 75

L64 ANSWER 28 OF 47 HCA COPYRIGHT 2003 ACS on STN
120:284279 laser diode-pumped self-frequency-doubling solid-state laser
packages. Okazaki, Yoji (Fuji Photo Film Co Ltd, Japan). Jpn.
Kokai Tokkyo Koho JP 05299750 A2 19931112 Heisei, 4 pp. (Japanese).
CODEN: JKXXAF. APPLICATION: JP 1992-96572 19920416.
AB A compactly bonded package comprises: a pump laser diode (output
wavelength .lambda. = .lambda.1); a heat sink; a rare earth-
doped self-frequency-**doubling** solid-state laser
slab with a pair of mirror-coated facets for .lambda. = .lambda.2;
and a nonlinear crystal having periodically-polarity-inverted
structure for a quasi-phase matching between .lambda.2 and .lambda.3
when .lambda. = .lambda.3 = .lambda.2/2, or among .lambda.1,
.lambda.2 and .lambda.4 when .lambda. = .lambda.4 = 1/.lambda.1 +
1/.lambda.2.
IT **1309-48-4**, **Magnesium oxide** (**MgO**
), uses
(dopants, in lithium niobate, self-frequency-doubling laser rods
from)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg═O

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(neodymium and magnesium **doped**, self-frequency-
doubling laser rods from, in package with pump laser)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IC ICM H01S003-109
ICS G02F001-37; H01S003-094; H01S003-16
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
IT **1309-48-4**, **Magnesium oxide** (**MgO**
), uses 7440-00-8, Neodymium, uses
(dopants, in lithium niobate, self-frequency-doubling laser rods
from)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(neodymium and magnesium **doped**, self-frequency-
doubling laser rods from, in package with pump laser)

L64 ANSWER 29 OF 47 HCA COPYRIGHT 2003 ACS on STN
120:90052 CW neodymium- and **magnesium oxide**-doped
lithium niobate (**LiNbO3**) self-frequency doubled laser with
high output power. Li, Ruining; Wang, Junmin; Liang, Xiaoyan; Xie,
Changde; Peng, Kunchi; Xu, Guanfeng (Inst. Opto-Electron. Res.,

Shanxi Univ., Taiyuan, 030006, Peop. Rep. China). Zhongguo Jiguang, 20(7), 486-8 (English) 1993. CODEN: ZHJIDO. ISSN: 0258-7025.

AB Continuous-wave (CW) self-frequency-doubled operation of Nd: **MgO**:**LiNbO3** laser was achieved in a nearly concentric cavity pumped by coherent radiation. The max. output of 2nd harmonic power as <12.2 mW and the conversion efficiency <23.5%/ W were obtained.

IT **12031-63-9**, Lithiumniobate
(laser of neodymium- and **magnesium oxide-doped**, self-frequency **doubled**, with high output power)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT **1309-48-4**, **Magnesium oxide**, properties
(laser of neodymium-doped lithium niobate doped with, self-frequency doubled, with high output power)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg═O

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT Lasers
(neodymium- and **magnesium oxide**-doped lithium niobate self-frequency doubled, with high output power)

IT **12031-63-9**, Lithiumniobate
(laser of neodymium- and **magnesium oxide-doped**, self-frequency **doubled**, with high output power)

IT **1309-48-4**, **Magnesium oxide**, properties
(laser of neodymium-doped lithium niobate doped with, self-frequency doubled, with high output power)

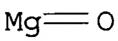
IT 7440-00-8
(lasers, neodymium- and **magnesium oxide**-doped lithium niobate self-frequency doubled, with high output power)

L64 ANSWER 30 OF 47 HCA COPYRIGHT 2003 ACS on STN

119:281602 Continuous-wave operation of a doubly resonant lithium niobate optical parametric oscillator system tunable from 966 to 1185 nm. Gerstenberger, D. C.; Wallace, R. W. (Lightwave Electronics Corp., Mountain View, CA, 94043, USA). Journal of the Optical Society of America B: Optical Physics, 10(9), 1681-3 (English) 1993. CODEN: JOBPDE. ISSN: 0740-3224.

AB The continuous-wave frequency-doubled output of a diode-pumped single-frequency Nd:YAG laser was used to pump a **MgO-doped LiNbO3 doubly** resonant optical parametric oscillator. This oscillator provided tunable output from 966 to 1185 nm and produced >100 mW of output for 700 mW of 1064-nm output from the diode-pumped Nd:YAG laser.

IT **1309-48-4**, **Magnesium oxide**, properties
(optical parametric oscillator from lithium niobate doped with, continuous-wave operation of doubly resonant)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical parametric resonator from **magnesium oxide**-doped, continuous-wave operation of doubly resonant)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST lithium niobate optical parametric oscillator; **magnesium oxide** optical parametric oscillator; continuous wave optical parametric oscillator
IT Lasers
(**magnesium oxide**-doped lithium niobate optical parametric resonator, continuous-wave operation of doubly resonant)
IT **1309-48-4**, **Magnesium oxide**, properties
(optical parametric oscillator from lithium niobate doped with, continuous-wave operation of doubly resonant)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical parametric resonator from **magnesium oxide**-doped, continuous-wave operation of doubly resonant)

L64 ANSWER 31 OF 47 HCA COPYRIGHT 2003 ACS on STN
118:244156 Laser apparatus. Amano, Takeshi (Hoya Corp., Japan). Jpn. Kokai Tokkyo Koho JP 04206977 A2 19920728 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1990-339162 19901130.
AB The app. comprises: a laser exciting beam source; a laser medium with a 1st cavity-mirror formed on the input facet; an external back-focussing 2nd cavity-mirror; a frequency-doubling crystal held at a const. temp.; and an amplifying beam source for the nonlinear optical crystal. The app. emits a highly stabilized intense single-mode visible light.
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(Nd-**doped**, amplifying frequency-**doubler** from, green-emitting, with YAG)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **1309-48-4**, **Magnesium oxide** (**MgO**), properties
(Nd-**doped**, amplifying frequency-**doubler** from,

green-emitting, with YAG)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

IC ICM H01S003-094
ICS H01S003-08; H01S003-108
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
IT Optical instruments
(Nd-**doped**, amplifying frequency-**doubler** from, green-emitting, with YAG)
IT 12007-41-9, Lithium boron oxide (LiB3O5) 12030-85-2, Potassium niobium oxide (KNbO3) **12031-63-9**, Lithium niobium oxide (**LiNbO3**) 12690-20-9, Potassium titanyl phosphate (KTiO(PO4)) 13701-59-2, Barium boron oxide (BaB2O4) 89595-41-5
(Nd-**doped**, amplifying frequency-**doubler** from, green-emitting, with YAG)
IT **1309-48-4**, **Magnesium oxide** (**MgO**), properties
(Nd-**doped**, amplifying frequency-**doubler** from, green-emitting, with YAG)

L64 ANSWER 32 OF 47 HCA COPYRIGHT 2003 ACS on STN
118:202375 Detection of chromium(3+) sites in magnesia chromium(3+) co-doped lithium niobate (**LiNbO3**) and chromium(3+)-doped lithium niobate. Jaque, F.; Garcia-Sole, J.; Camarillo, E.; Lopez, F. J.; Murrieta S., H.; Hernandez A., J. (Fac. Cienc., Univ. Auton. Madrid, Madrid, Spain). Physical Review B: Condensed Matter and Materials Physics, 47(9), 5432-4 (English) 1993. CODEN: PRBMDO. ISSN: 0163-1829.
AB Exptl. results describing Cr3+ sites in **LiNbO3**:Cr and **LiNbO3**:**MgO**,Cr previously detd. with EPR, ENDOR, and optical techniques, are correlated in terms of the formation of 3 Cr sites: Cr3+ ions in Li+ and Nb5+ positions, and a Cr3+ (Nb5+)-Mg2+ center that only appears in the **double-doped** system. The majority of the unperturbed centers, Cr3+ (Li+) and Cr3+ (Nb5+), are forming close pairs and only a small fraction of Cr3+ (Li+) ions are dild. into the crystal host, giving rise to an EPR signal.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(lattice location of chromium(3+) doped in, with and without magnesia dopant)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **1309-48-4**, Magnesia, properties
(lattice site location of chromium(3+) in lithium niobate doped with chromium and)
RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

CC 75-3 (Crystallography and Liquid Crystals)
Section cross-reference(s): 77
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(lattice location of chromium(3+) doped in, with and without magnesia dopant)
IT **1309-48-4**, Magnesia, properties
(lattice site location of chromium(3+) in lithium niobate doped with chromium and)

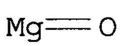
L64 ANSWER 33 OF 47 HCA COPYRIGHT 2003 ACS on STN
116:183751 Optical absorption properties of doped lithium niobate crystals. Zhu, Jiangou; Zhao, Shipin; Xiao, Dingquan; Wang, Xiu; Xu, Guanfeng (Dep. Mater. Sci., Sichuan Univ., Chengdu, 610064, Peop. Rep. China). Journal of Physics: Condensed Matter, 4(11), 2977-83 (English) 1992. CODEN: JCOMEL. ISSN: 0953-8984.
AB The optical transmittance of pure **LiNbO3** single crystals and of **LiNbO3** single crystals heavily doped with **MgO**, and **double doped** with **MgO** and TiO2 were measured from the UV to the visible range with the incident light being perpendicular and parallel, resp., to the Z axis of the crystals. The wavelength dependence of the absorption coeff. .alpha. and its root .alpha.1/2 (.alpha. vs. h.nu. and .alpha.1/2 vs. h.nu., resp.) were calcd. and the characteristics of the absorption edges are discussed. The absorption edges below 3.8 eV of all samples are attributable to indirect transition. The energy gaps Eg and Eg' of the crystals, which correspond to the direct transition and the indirect transition, resp., and the energy of phonons taking part in the indirect transition were calcd. Eg And Eg' are related to the type and amt. of doped ions, and doping with **MgO** and with TiO2 will make the energy gap Eg' increase and decrease, resp., causing the indirect transition absorption edges to move towards the UV and IR, resp.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical absorption properties of doped)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **1309-48-4**, **Magnesium oxide**, properties
(optical absorption properties of lithium niobate doped with)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

CC 73-4 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical absorption properties of doped)
IT **1309-48-4**, **Magnesium oxide**, properties
13463-67-7, Titanium dioxide, properties
(optical absorption properties of lithium niobate doped with)

L64 ANSWER 34 OF 47 HCA COPYRIGHT 2003 ACS on STN
116:71459 Frequency-stabilized and a **doubled** neodymium-**doped** YAG CW laser. Gao, Jiangrui; Zhang, Xiaohu; Li, Jun; Peng, Kunchi; Jiang, Dehua (Res. Inst. Opto-Electron., Shanxi Univ., Taiyuan, 030006, Peop. Rep. China). Zhongguo Jiguang, 18(10), 721-5 (Chinese) 1991. CODEN: ZHJIDO. ISSN: 0258-7025.
AB A frequency stabilized and doubled Nd:YAG laser was designed. The configuration of cavity was recalcd. Both KTP and **MgO**:**LiNbO3** were used for frequency doubling and the method of angular match was chosen. The output powers of 800 mW and 50 .apprx. 100 mW were obtained, resp., for the fundamental (1.06 .mu.m) and 2nd harmonic generation (0.53 .mu.m) using a pumping power of 2.5 kW. The intensity fluctuations were <2% for the 1.06 .mu.m wave and 5% for 0.53 .mu.m wave. The frequency stability at 1.06 .mu. and 0.53 .mu.m signal-frequency laser output were, resp., better than 2 and 5 MHz.
IT **1309-48-4**, **Magnesium oxide**, uses
(neodymium-YAG laser frequency doubling using lithium niobate contg.)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(neodymium-YAG laser frequency doubling using **magnesium oxide**-contg.)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
IT **1309-48-4**, **Magnesium oxide**, uses
(neodymium-YAG laser frequency doubling using lithium niobate contg.)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(neodymium-YAG laser frequency doubling using **magnesium oxide**-contg.)

L64 ANSWER 35 OF 47 HCA COPYRIGHT 2003 ACS on STN
116:12598 The hydroxide absorption spectrum of magnesium + titanium doped lithium niobate single crystals. Xiao, Dingquan; Zhu, Jianguo; Zhao, Shipin; Wang, Xiu; Xu, Guanfeng (Dep. Mater. Sci., Sichuan Univ., Chengdu, 610064, Peop. Rep. China). Physica Status Solidi A: Applied Research, 127(2), K143-K146 (English) 1991.

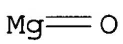
CODEN: PSSABA. ISSN: 0031-8965.

AB When Ti slightly doped (e.g., TiO2 <1.5 mol%) in heavily **MgO** -doped (>6 mol%) **LiNbO3** crystals, Ti4+ would replace Nb5+, and a Ti4+-Mg2+ pair can be neutral without charge compensation by OH-, as was assumed previously for Cr4+, therefore no new OH- absorption band was obsd. When Ti4+ was heavily doped (.gtoreq.2 mol%) in heavily **MgO**-doped **LiNbO3** crystals, some Ti4+ would be changed to Ti3+ because of lattice distortion. The OH- dipole directed perpendicular to the c-axis can be thought to be located between a Ti3+ and Mg2+ which occupy neighboring octahedra along the c-axis. Thus the new OH- band at 3488 cm-1 can be regarded as the contribution of Ti3+ (Nb site)-OH-(O site)-Mg2+(Li site) complex. The OH- absorption spectra in heavily **double -doped LiNbO3** crystals are sensitive with the changes of doped ion environment.

IT **1309-48-4**, **Magnesium oxide**, properties
(IR spectrum of hydroxide in lithium niobate doped with, with and without titanium)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(IR spectrum of hydroxide in magnesia-titanium-doped)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75

IT **1309-48-4**, **Magnesium oxide**, properties
(IR spectrum of hydroxide in lithium niobate doped with, with and without titanium)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(IR spectrum of hydroxide in magnesia-titanium-doped)

L64 ANSWER 36 OF 47 HCA COPYRIGHT 2003 ACS on STN

115:290172 Study of the fluorescence spectra of neodymium(3+)- and magnesia-**double doped** lithium niobate. Li, Jiang; Li, Bing; Wen, Jinke; Wang, Huafu (Dep. Phys., Nankai Univ., Tianjin, 300 071, Peop. Rep. China). Physica Status Solidi A: Applied Research, 127(2), K139-K142 (English) 1991. CODEN: PSSABA. ISSN: 0031-8965.

AB Fluorescence spectra of **LiNbO3**:**MgO**:Nd3+ single crystals were obtained and fall into two classes. Class I is represented by the spectra of **LiNbO3**:**MgO**(7 mol%):Nd3+. The spectra of **LiNbO3**:**MgO**(5 mol%):Nd3+ belong to this class. Class II is represented by the spectra of **LiNbO3**:Nd3+. The spectra of **LiNbO3**: **MgO**(2 mol%):Nd3+ belong to this class. The .pi.(.vector.E

.dblvert. .vector.c) and .sigma.(.vector.E .perp. .vector.c) polarizations are represented.

IT **1309-48-4**, **Magnesium oxide**, properties
(fluorescence of lithium niobate doped with neodymium(3+) and)

RN 1309-48-4 HCA

CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(fluorescence of **magnesium oxide** -neodymium(3+)-doped)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-5 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT Fluorescence
(of lithium niobate doped with **magnesium oxide** and neodymium(3+))

IT 14913-52-1, Neodymium(3+), properties
(fluorescence of lithium niobate doped with **magnesium oxide** and)

IT **1309-48-4**, **Magnesium oxide**, properties
(fluorescence of lithium niobate doped with neodymium(3+) and)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(fluorescence of **magnesium oxide** -neodymium(3+)-doped)

L64 ANSWER 37 OF 47 HCA

115:170023 Second harmonic generation using an active nonlinear medium, neodymium- and **magnesium oxide**-doped lithium niobate (**LiNbO3**). Gong, Mali; Xu, Guangfeng; Han, Kai; Zhai, Gang (Southwest Inst. Tech. Phys., Chengdu, 610015, Peop. Rep. China). Guangxue Xuebao, 11(3), 283-4 (Chinese) 1991. CODEN: GUXUDC. ISSN: 0253-2239.

AB Self-frequency doubled laser was demonstrated by using Nd: **MgO:LiNbO3** as active and nonlinear optical medium. Pumped by a small Xe flashlamp, the 2nd harmonic wave (547 nm) was generated at room-temp. with 4.8 J threshold and 400 .mu.J/shot max. output. The temp. range of operation is over 20 .apprx. 45.degree. and photorefractive damage was not obsd.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(second harmonic generation by active nonlinear medium from neodymium- and **magnesium oxide**-contg.)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

IT **1309-48-4**, **Magnesium oxide**, properties
(second harmonic generation by active nonlinear medium from neodymium-doped lithium niobate contg.)

RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST laser frequency **doubled doped** lithium niobate; neodymium magnesium lithium niobate second harmonic
IT Lasers
(neodymium-**magnesium oxide**-lithium niobate, self-frequency doubled)
IT Optical nonlinear property
(harmonic generation, second, by neodymium-**magnesium oxide**-doped lithium niobate)
IT 7440-00-8
(lasers, neodymium-**magnesium oxide**-lithium niobate, self-frequency doubled)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(second harmonic generation by active nonlinear medium from neodymium- and **magnesium oxide**-contg.)
IT **1309-48-4**, **Magnesium oxide**, properties
(second harmonic generation by active nonlinear medium from neodymium-doped lithium niobate contg.)

L64 ANSWER 38 OF 47 HCA COPYRIGHT 2003 ACS on STN
114:216932 Dispersion of refractive indices of magnesium- and yttrium-doped lithium niobate (**LiNbO3**) crystals. Aleksandrovskii, A. L.; Ershova, G. I.; Kitaeva, G. Kh.; Kulik, S. P.; Naumova, I. I.; Tarasenko, V. V. (Mosk. Gos. Univ., Moscow, USSR). Kvantovaya Elektronika (Moscow), 18(2), 254-6 (Russian) 1991. CODEN: KVEKA3. ISSN: 0368-7147.
AB Refractive indexes of **LiNbO3** crystals doped by Mg and Y were measured in the visible and IR regions. Coeffs. of the Sellmeier formula were calcd. which describe dispersions of the refractive indexes for ordinary and extraordinary waves in the region of 0.4-1.1 .mu.m. The method of parametric light scattering was used to investigate the dispersion of the crystal with the mol. concn. of the **MgO** of 5% in the IR wavelength region up to 5 .mu.m. Angular characteristics were detd. of frequency **doublers** manufd. from **doped LiNbO3** crystals.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(refractive index dispersion of magnesium- or yttrium-contg.)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(refractive index dispersion of magnesium- or yttrium-contg.)

L64 ANSWER 39 OF 47 HCA COPYRIGHT 2003 ACS on STN
113:242809 Studies of absorption spectra and the photovoltaic effect in magnesium and iron co-doped lithium niobate crystals. Feng, Huixian; Wen, Jinke; Wang, Hong; Wang, Huafu (Dep. Phys., Nankai Univ., Tianjin, Peop. Rep. China). Applied Physics A: Solids and Surfaces, A51(5), 394-7 (English) 1990. CODEN: APSFDB. ISSN: 0721-7250.
AB The absorption spectra, photoconductivities and photovoltaic currents of **LiNbO3**:Fe crystals with different Mg doping levels and Li/Nb ratios in the oxidized state have been investigated at room temp. The Fe2+ ions in **LiNbO3**:Mg:Fe with Mg content above a crit. value are more easily oxidized than in crystals with Mg content below a crit. value. The photocond. of **LiNbO3**:Mg:Fe crystals with Mg content above a crit. value is one order of magnitude higher than those with Mg content below a crit. value, however, the photovoltaic current of the former is one order of magnitude lower than the latter. The differences are postulated to be due to different sites of Fe in these two classes of crystals.
IT **12031-63-9**
(photoelec. properties of, iron and magnesium doping effect on)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 76-5 (Electric Phenomena)
Section cross-reference(s): 73
ST lithium niobate **magnesium iron doping**; optical absorption photocond niobate crystal; photovoltaic effect niobate
IT **12031-63-9**
(photoelec. properties of, iron and magnesium doping effect on)

L64 ANSWER 40 OF 47 HCA COPYRIGHT 2003 ACS on STN
113:182743 Photorefraction and photovoltaic effect in magnesium- and iron-**doped** lithium niobate (**LiNbO3**). Wen, Jinke; Wang, Hong; Zhu, Yaping; Tang, Yansheng; Wang, Huafu (Dep. Phys., Nankai Univ., Tianjin, Peop. Rep. China). Rengong Jingti Xuebao, 18(3), 222-4 (Chinese) 1989. CODEN: RJXUEN. ISSN: 1000-985X.
AB The photorefraction and photovoltaic effects in Li-rich **LiNbO3** co-**doped** with Mg and Fe were studied in comparison with that in **LiNbO3**:Fe and Li-rich **LiNbO3**:Mg. The photorefraction, photocond. and photovoltaic current of Li-rich **LiNbO3:Mg:Fe** are comparable to those of Li-rich **LiNbO3**:Mg, but are quite different from those of **LiNbO3**:Fe.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(photorefraction and photovoltaic effect in magnesium- and iron-**doped**)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
IT **1309-48-4**, Magnesia, properties
 (refraction and photovoltaic effect of lithium niobate **doped** with)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)

Mg=O

CC 76-5 (Electric Phenomena)
 Section cross-reference(s): 73
ST refraction lithium niobate **iron magnesium**; photocond lithium niobate **iron magnesium**; photovoltage lithium niobate **iron magnesium**
IT Photoconductivity and Photoconduction
 Photovoltaic effect
 (of lithium niobate **doped** with magnesium and iron)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
 (photorefraction and photovoltaic effect in magnesium- and iron-**doped**)
IT 1309-37-1, Ferric oxide, properties **1309-48-4**, Magnesia, properties 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties
 (refraction and photovoltaic effect of lithium niobate **doped** with)

L64 ANSWER 41 OF 47 HCA COPYRIGHT 2003 ACS on STN
113:143307 Photoinduced hole carriers and enhanced resistance to photorefraction in magnesium-**doped** lithium niobate crystals. Wang, Hong; Wen, Jinke; Li, Jiang; Wang, Huafu; Jing, Jing (Dep. Phys., Nankai Univ., Tianjin, 300071, Peop. Rep. China). Applied Physics Letters, 57(4), 344-5 (English) 1990. CODEN: APPLAB. ISSN: 0003-6951.
AB The sign of photoinduced free carriers of **LiNbO3**:Mg and **LiNbO3**:**Mg**:**Fe** (0.05 wt. %) with various **MgO** contents has been detd. by the holog. technique. The photorefraction of these crystals has also been studied. The enhanced resistance to photorefraction of **LiNbO3**:Mg (>5 mol % **MgO**) results from the occurrence of photoinduced hole free carriers, whose concn. is nearly equal to the electron.
IT **12031-63-9**
 (photoinduced hole and photorefraction of, magnesium or iron **doping** effect on)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 76-5 (Electric Phenomena)
 Section cross-reference(s): 73
ST lithium niobate photoinduced hole carrier; optical refraction niobate **magnesium iron doping**
IT Hole

(photoinduced, in lithium niobate, iron or magnesium **doping** effect on)

IT **12031-63-9**
(photoinduced hole and photorefraction of, magnesium or iron **doping** effect on)

IT 14452-57-4, Magnesium dioxide
(photoinduced holes and photorefraction of lithium niobate **doped** with)

IT 1309-37-1, Iron sesquioxide, properties 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties
(photoinduced holes and photorefraction of lithium niobate **doped** with)

L64 ANSWER 42 OF 47 HCA COPYRIGHT 2003 ACS on STN

113:122709 A study of optical absorption, ESR spectra and photorefraction in magnesium and iron **doped** lithium niobate crystals. Feng, Xiqi; Tang, Lianan; Ying, Jifeng (Shanghai Inst. Ceram., Acad. Sin., Shanghai, 200050, Peop. Rep. China). Ferroelectrics, 107, 21-6 (English) 1990. CODEN: FEROA8. ISSN: 0015-0193.

AB Fe was chosen as a marking impurity, and 2 kinds of Fe-**doped** **LiNbO3** crystals were grown. Their Li/Nb and contents of **MgO** in the growing melt are 0.945+O mol% **MgO** and 0.945+6 mol% **MgO**, resp. The amt. of Fe2O3 in the crystals is close to each other. The measurements of optical absorption edge, OH- absorption bands and Fe3+ ESR spectra in **LiNbO3** :Fe and **LiNbO3**:**Mg+Fe** were made. As exptl. results showed, 2 significant difference between them revealed that the ionic environment of Fe3+ cation in the 2 kinds of Fe-**doped** crystals is different. The Fe3+ cation should substitute for Nb in **LiNbO3**:**Mg+Fe** crystal rather than substitute for Li in **LiNbO3**:Fe crystal. Based on this argument, the exptl. results can be explained of optical absorption and ESR measurements. The photorefraction in the Fe-**doped** **LiNbO3** crystals was obsd. and estd. qual. by using a focused Ar laser beam. The resistance to the optical-damage of congruent **LiNbO3** with 6.0 mol.% **MgO** added to the growing melt can be greatly improved, even though photorefraction sensitive Fe impurity was **doped**.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical absorption and ESR and photorefraction in iron- and magnesium-**doped**)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

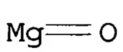
CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 77

ST optical absorption **magnesium** **iron** lithium niobate; ESR **magnesium** **iron** lithium niobate

IT Electron spin resonance

Optical absorption
(of iron- and magnesium-**doped** lithium niobate)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical absorption and ESR and photorefraction in iron- and magnesium-**doped**)
IT 7439-95-4, Magnesium, properties
(optical absorption and ESR and photorefraction in lithium niobate **doped** with iron and)
IT 7439-89-6, Iron, properties
(optical absorption and ESR and photorefraction in lithium niobate **doped** with magnesium and)

L64 ANSWER 43 OF 47 HCA COPYRIGHT 2003 ACS on STN
113:105847 Efficient frequency doubling of a diode-laser-pumped mode-locked neodymium-doped YAG laser using an external resonant cavity. Maker, G. T.; Ferguson, A. I. (Dep. Phys., Univ. Southampton, Southampton, S09 5NH, UK). Optics Communications, 76(5-6), 369-75 (English) 1990. CODEN: OPCOB8. ISSN: 0030-4018.
AB The frequency doubling is reported of a continuous-wave mode-locked diode-laser-pumped Nd:YAG laser to 532 nm using a crystal of **MgO:LiNbO3** in an external enhancement ring cavity. Using a 1 W laser diode pump the Nd:YAG laser produced an av. power of 180 mW in 11.5 ps pulses at a repetition rate of 360 MHz. With 142 mW incident onto the enhancement cavity a frequency doubling energy conversion efficiency of 61% to 532 nm was obtained, giving 87 mW av. power in bandwidth limited pulses of 8.5 ps duration. Simply by amplitude modulating the laser diode the Nd:YAG laser could be gain switched, giving rise to peak powers in the green in excess of 130 W.
IT **1309-48-4**, **Magnesium oxide**, uses and miscellaneous
(frequency **doubling** of neodymium-**doped** YAG laser using lithium niobate contg., in external resonant cavity)
RN 1309-48-4 HCA
CN Magnesium oxide (MgO) (9CI) (CA INDEX NAME)



IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(frequency **doubling** of neodymium-**doped** YAG laser using **magnesium oxide**-contg., in external resonant cavity)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST frequency doubling neodymium YAG laser; **magnesium oxide** frequency doubling laser; lithium niobate frequency doubling laser
IT Laser radiation

(frequency **doubling** of neodymium-**doped** YAG,
using external resonant cavity)
IT **1309-48-4**, **Magnesium oxide**, uses and
miscellaneous
(frequency **doubling** of neodymium-**doped** YAG
laser using lithium niobate contg., in external resonant cavity)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(frequency **doubling** of neodymium-**doped** YAG
laser using **magnesium oxide**-contg., in
external resonant cavity)
IT 7440-00-8
(laser radiation, frequency **doubling** of neodymium-
doped YAG, using external resonant cavity)
IT 12005-21-9, YAG
(lasers from neodymium-**doped**, frequency
doubling of, using external resonant cavity)

L64 ANSWER 44 OF 47 HCA COPYRIGHT 2003 ACS on STN
113:13994 Infrared absorption study of hydroxide in magnesium and
magnesium + **iron**-**doped** lithium niobate (
LiNbO3) crystals. Wang, Hong; Wen, Jinke; Li, Bin; Wang,
Huafu (Dep. Phys., Nankai Univ., Tianjin, 300071, Peop. Rep. China).
Physica Status Solidi A: Applied Research, 118(1), K47-K50
(English) 1990. CODEN: PSSABA. ISSN: 0031-8965.
AB The IR absorption band of OH- was investigated in **LiNbO3**
:Mg:Fe with various Li/Nb ratios and Mg contents, and for
comparison, **LiNbO3**:Mg was also studied. The band at 3535
cm-1 should be assocd. with the OH bond near Mg in Nb site (MgNb)
and that at 3503 cm-1 with the bond near Fe in the Nb site (FeNb),
since above the threshold of Mg content the band at 3535 cm-1
appears for both **LiNbO3**:Mg:Fe. If the concn. of MgNb is
high enough, most of the protons probably gather near MgNb.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(IR absorption band of hydroxide in **iron**-
magnesium-**doped**)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(IR absorption band of hydroxide in **iron**-
magnesium-**doped**)

L64 ANSWER 45 OF 47 HCA COPYRIGHT 2003 ACS on STN
112:148034 Optical absorption and ESR spectra in magnesium- and iron-
doped lithium niobate (**LiNbO3**) crystals. Feng,
Xiqi; Zhang, Jizhou; Ying, Jifeng; Liu, Jiancheng (Lab. Solid State
Microstruct., Nanjing Univ., Nanjing, Peop. Rep. China). Hongwai
Yanjiu, A-ji, 8(5), 369-73 (Chinese) 1989. CODEN: HYAAED. ISSN:
0258-7114.
AB Taking transition metal iron as a marked impurity, 2 kinds of Fe-

doped LiNbO3 crystals were grown. The amt. of
Fe2O3 in the crystals is close to each other. Their contents of
MgO in congruent growing melt are 0.945 + 0 mol% **MgO**
and 0.945 + 6 mol% **MgO**, resp. The measurements of optical
absorption edge, OH- absorption bands and Fe3+ ESR spectra in
LiNbO3: Fe and **LiNbO3**: **Mg** + **Fe**
are made. The significant difference between them reveals that the
ionic environment of Fe3+ cation in the 2 kinds of Fe- **doped**
crystals is different. According to this, the exptl. results of
optical absorption and ESR measurements are qual. explained.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(ESR and optical absorption of magnesium- and iron-**doped**
)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related
Properties)
Section cross-reference(s): 76, 77

ST ESR **iron magnesium** lithium niobate; optical
absorption **iron magnesium** lithium niobate

IT Optical absorption
(by iron- and magnesium-**doped** lithium niobate)

IT Electron spin resonance
(of iron- and magnesium-**doped** lithium niobate)

IT 7439-95-4, Magnesium, properties
(ESR and optical absorption of iron-**doped** lithium
niobate contg.)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(ESR and optical absorption of magnesium- and iron-**doped**
)

L64 ANSWER 46 OF 47 HCA COPYRIGHT 2003 ACS on STN

110:47540 Photorefraction in lithium-rich **iron-magnesium-doped** lithium niobate crystals. Chang,
Teijun; Wen, Jinke; Zhu, Yaping; Wang, Zhefu; Tang, Yansheng; Wang,
Huafu (Dep. Phys., Nankai Univ., Tianjin, Peop. Rep. China).
Chinese Physics Letters, 5(10), 449-52 (English) 1988. CODEN:
CPLEEU. ISSN: 0256-307X.

AB The ability of Li-rich **LiNbO3**:Mg (5 mol %):Fe(0.1 wt %) to
resist photorefraction is comparable to that of **LiNbO3**:Mg
(5 mol %), even though the photorefraction sensitive dopant Fe is
added. The nuclear quadrupole splitting and isomer shift of 57Fe in
Li-rich **LiNbO3**:Mg:57Fe and **LiNbO3**:57Fe are quite
different. The ESR spectra of the 2 kinds of crystals are
significantly different, too. The enhanced resistance to
photorefraction may be due to the change in occupation sites of Fe
ions.

IT **12031-63-9D**, Lithium niobate (**LiNbO3**),
lithium-excess
(photorefraction and Moessbauer and ESR spectra of **iron-magnesium-doped**)

RN 12031-63-9 HCA
CN Lithium niobium oxide ($LiNbO_3$) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-2 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 77
IT Electron spin resonance
(of lithium-rich **iron-magnesium-doped** lithium niobate)
IT Moessbauer effect
(of lithium-rich **iron-magnesium-doped** lithium niobate, iron-57)
IT 14762-69-7
(moessbauer effect, of lithium-rich **iron-magnesium-doped** lithium niobate, iron-57)
IT **12031-63-9D**, Lithium niobate (**$LiNbO_3$**), lithium-excess
(photorefraction and Moessbauer and ESR spectra of **iron-magnesium-doped**)

L64 ANSWER 47 OF 47 HCA
109:218560 X-ray and UV influence on the optical absorption spectra of the nonphotorefractive lithium niobate. Volk, T. R.; Rubinina, N. M. (A. V. Shubnikov Inst. Crystallogr., Moscow, USSR). Physica Status Solidi A: Applied Research, 108(1), 437-42 (English) 1988. CODEN: PSSABA. ISSN: 0031-8965.
AB A comparative study is made of optical properties in **$LiNbO_3$**:Fe, **$LiNbO_3$**:Mg, and **$LiNbO_3$**:Fe:Mg. The value of the photorefraction in **$LiNbO_3$**:Fe:Mg decreases not less than by 103 as compared with **$LiNbO_3$**:Fe. X-ray and UV-induced change of the absorption spectra reveal a change in the type of the radiation-induced center in Mg-doped crystals. X-ray induced extra Fe^{2+} is not revealed in **$LiNbO_3$**:Fe:Mg indicating the alteration of the electron acceptor center due to Mg incorporation.
IT **12031-63-9**, Lithium niobate (**$LiNbO_3$**)
(optical absorption spectra of nonphotorefractive, x-ray and UV effect on)
RN 12031-63-9 HCA
CN Lithium niobium oxide ($LiNbO_3$) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-4 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
IT Ultraviolet and visible spectra
(of **iron-magnesium-doped** lithium niobate, x-ray and UV effect on)
IT **12031-63-9**, Lithium niobate (**$LiNbO_3$**)
(optical absorption spectra of nonphotorefractive, x-ray and UV effect on)

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L65 ANSWER 1 OF 9 HCA COPYRIGHT 2003 ACS on STN
126:206189 The bulk photovoltaic effect of photorefractive LiNbO3:Fe crystals at high light intensities. Simon, M.; Wevering, S.; Buse, K.; Kraetzig, E. (Fac. Phys., Univ. Osnabrueck, Osnabrueck, D-49069, Germany). Journal of Physics D: Applied Physics, 30(1), 144-149 (English) 1997. CODEN: JPAPBE. ISSN: 0022-3727. Publisher: Institute of Physics Publishing.

AB Direct measurements of the bulk photovoltaic c.d. jphv in photorefractive **LiNbO3**:Fe, **LiNbO3**:**Mg**, **Fe** and **LiNbO3**:**Zn**, **Fe** crystals were performed at high light intensities. Illumination of the crystals with light pulses of a Q-switched frequency-doubled Nd:YAG laser (pulse duration 20 ns; light wavelength 532 nm) yielded a photovoltaic current through the crystals which charged a capacitor. Afterwards an electrometer measured the voltage of the charged capacitor. From this voltage and from capacity and exposure time the c.d. jphv was deduced. For intensities >1017 W m-2 a contribution to jphv which increased quadratically with light intensity l appeared for LiNbO3:Fe crystals. Co-**doping** with Mg and Zn lowered the quadratic component. The authors' results are in good qual. and quant. agreement with previous holog. measurements and support the claim that the intrinsic defect NbLi4+/5+ acts as a secondary photorefractive center in LiNbO3 at high light intensities.

CC 76-5 (Electric Phenomena)
Section cross-reference(s): 57

ST photovoltage photorefractive **doped** lithium niobate; iron **doped** lithium niobate photovoltage

IT **Dopants**
Photorefractive materials
Photovoltage
(photovoltaic effect of photorefractive LiNbO3:Fe crystals at high light intensities)

L65 ANSWER 2 OF 9 HCA COPYRIGHT 2003 ACS on STN
126:67853 A change model of defect structure in **LiNbO3**: **Mg**,**Fe** crystals. Liu, Jianjun; Zhang, Wanlin; Zhang, Guangyin (Department of Physics, Nankai University, Tianjin, 300071, Costa Rica). Chinese Science Bulletin, 41(17), 1428-1430 (English) 1996. CODEN: CSBUEF. ISSN: 1001-6538. Publisher: Science Press.

AB The defect structure in LiNbO3 crystal contg. Mg and Fe was studied by using the OH- absorption spectra. A model of the change of the defect structure due to the heavy Mg **doping** in the crystal is proposed.

CC 75-3 (Crystallography and Liquid Crystals)

L65 ANSWER 3 OF 9 HCA COPYRIGHT 2003 ACS on STN
126:52726 Growth and holographic properties of **Zn**:**Fe** :**LiNbO3** crystal. Zhao, Yequan; Li, Minghua; Xu, Yuheng; Ge, Yuncheng (Dep. of Applied Chem., Harbin Inst. of Technology,

Harbin, 150001, Peop. Rep. China). Rengong Jingti Xuebao, 25(3), 257-260 (Chinese) 1996. CODEN: RJXUEN. ISSN: 1000-9868. Publisher: Huaxue Gongye Chubanshe.

AB The growth technique of **Zn:Fe:LiNbO3** crystal is reported in detail for the first time. The absorption spectra, diffractive efficiencies, and response times were measured. The response times of **Zn:Fe:LiNbO3** are less than that of Fe:LiNbO3. The diffractive efficiencies are higher than 80%.

CC 74-8 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)
Section cross-reference(s): 75

IT Holography
(growth of iron- and zinc-**doped** lithium niobate crystals for)

IT Crystal growth
(of iron- and zinc-**doped** lithium niobate crystals for holog.)

IT 12031-63-9P, Lithium niobate
(growth and holog. properties of iron- and zinc-**doped**)

IT 7440-66-6, Zinc, uses
(growth and holog. properties of lithium niobate crystals **doped** with iron and)

IT 7439-89-6, Iron, uses
(growth and holog. properties of lithium niobate crystals **doped** with zinc and)

L65 ANSWER 4 OF 9 HCA COPYRIGHT 2003 ACS on STN

125:287540 Microscopic mechanism of suppressing photorefraction in **LiNbO3:Mg,Fe** crystals. Liu, Jianjun; Zhang, Wanlin; Zhang, Guangyin (Dep. Phys., Nankai Univ., Tianjin, 300071, Peop. Rep. China). Solid State Communications, 98(6), 523-526 (English) 1996. CODEN: SSCOA4. ISSN: 0038-1098. Publisher: Elsevier.

AB The IR absorption spectra of OH- in **LiNbO3:Mg, Fe** crystals were studied. Near the Mg concn. threshold the OH- absorption bands successively shift from 3484 cm-1 to 2504 cm-1 and 3535 cm-1. The intensity of the 3504 cm-1 band firstly increases to a max. value, then decreases as the Mg content increases. This result contributed to the substitution of Fe ions into Nb sites due to Mg-**doping** in crystal. The site alteration of Fe ions from the Li sites to Nb sites is the origin of increasing the resistance against optical damage.

CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 76

L65 ANSWER 5 OF 9 HCA COPYRIGHT 2003 ACS on STN

116:247071 Low-symmetry iron-magnesium complexes in magnesium **doped** lithium niobate. Malovichko, G. I.; Grachov, V. G.; Kokanyan, E. P. (Int. Mater. Sci., Kiev, 252180, USSR). Ferroelectrics, 125(1-4), 289-94 (English) 1992. CODEN: FEROA8.

ISSN: 0015-0193.
AB Congruent lithium niobium crystals **doped** with Mg and Fe are investigated by using NMR and EPR, x-ray structure and fluorescence analyses. It is shown that the low-symmetry complexes FeNb-MgLi are created at magnesium concns. above 4.5 mol.%.
CC 77-6 (Magnetic Phenomena)
IT 12031-63-9, Lithium niobate (**LiNbO3**)
(ESR of **iron-magnesium** low-symmetry complexes in)

L65 ANSWER 6 OF 9 HCA COPYRIGHT 2003 ACS on STN
113:16010 Photovoltaic effect and photorefraction in magnesium-**doped** lithium niobate (LiNbO3) crystals. Wen, Jinke; Wang, Liang; Tang, Yanseng; Wang, Hong; Zhu, Yaping; Wang, Huafu (Dep. Phys., Nankai Univ., Tianjin, Peop. Rep. China). Ferroelectrics, 101, 299-301 (English) 1990. CODEN: FEROA8. ISSN: 0015-0193.
AB With relation to photorefraction, it has been found that higher light irradn. intensities can be withstood by Li-rich LiNbO3:Mg (5 mol%) than by the congruent LiNbO3:Mg (5 mol). The photocond. of the former is an order of magnitude larger than that of the latter. **Doping** with 0.1 wt.% Fe in Li-rich LiNbO3:Mg (5 mol%) does not distinctly alter its ability to resist photorefraction. The photovoltaic currents of Li-rich **LiNbO3:Mg: Fe** and Li-rich LiNbO3:Mg are nearly equal and are two orders of magnitude smaller than that of LiNbO3:Fe. The photocond. of Li-rich **LiNbO3:Mg:Fe** is an order of magnitude smaller than that of LiNbO3:Fe. The photocond. of Li-rich **LiNbO3:Mg:Fe** is an order of magnitude smaller than that of Li-rich LiNbO3:Mg and is much larger than that of LiNbO3:Fe.
CC 76-8 (Electric Phenomena)
ST lithium niobate photovoltaic effect; magnesium **doping** lithium niobate photorefraction
IT Photovoltaic effect
(in magnesium-**doped** lithium niobate crystals)
IT Photoconductivity and Photoconduction
(of magnesium-**doped** lithium niobate)
IT 7439-95-4, Magnesium, properties
(photovoltaic effect and photorefraction in lithium niobate crystals **doped** with)
IT 12031-63-9, Lithium niobium oxide (LiNbO3)
(photovoltaic effect and photorefraction in magnesium-**doped** crystals of)

L65 ANSWER 7 OF 9 HCA COPYRIGHT 2003 ACS on STN
112:208992 Light-induced charged transport in magnesium- and iron-**doped** lithium niobate (**LiNbO3:Mg, Fe**) crystals. Sommerfeldt, R.; Holtman, L.; Kraetzig, E.; Grabmaier, B. C. (Fachber. Phys., Univ. Osnabrueck, Osnabrueck, D-4500, Fed. Rep. Ger.). Ferroelectrics, 92, 219-25 (English) 1989. CODEN: FEROA8. ISSN: 0015-0193.
AB Light-induced charge transport properties of LiNbO3 crystals contg.

Mg **dopants** of different concns. as well as Fe ions in different valence states were studied to obtain quant. information on the influence of Mg. The photovoltaic effect and the holog. sensitivity are mainly detd. by the Fe2+ concn. and depend very weakly on Mg **doping** or the Li/Nb ratio in the crystals. The photocond. increases considerably with increasing Mg concn., thus diminishing the satn. value of light-induced refractive index change.

CC 76-5 (Electric Phenomena)
Section cross-reference(s): 73, 74

ST photocond lithium niobate magnesium **dopant**; photovoltage lithium niobate magnesium **dopant**; holog lithium niobate magnesium **dopant**; refraction lithium niobate magnesium **dopant**

IT Holography
Photoconductivity and Photoconduction
Photovoltaic effect
(of lithium niobate **doped** with iron and magnesium)

IT 7439-89-6, Iron, properties
(photoelec. effect of lithium niobate **doped** with magnesium and)

IT 12031-63-9, Lithium niobate (LiNbO3)
(photoelec. effects of iron and magnesium-**doped**)

IT 7439-95-4, Magnesium, properties
(photoelec. effects of lithium niobate **doped** with iron and)

L65 ANSWER 8 OF 9 HCA COPYRIGHT 2003 ACS on STN

112:14454 X-ray refraction in lithium-rich iron- and magnesium-**doped** lithium niobate (LiNbO3) crystal. Feng, Huixian; Wen, Jinke; Tang, Yansheng; Wang, Huafu; Bai, Lingjun (Dep. Phys., Nankai Univ., Tianjin, Peop. Rep. China). Wuji Cailiao Xuebao, 4(2), 188-92 (Chinese) 1989. CODEN: WCXUET. ISSN: 1000-324X.

AB The x-ray refraction and ESR spectra of **LiNbO3**:**Fe**:**Mg**, **LiNbO3**:Fe and undoped LiNbO3 were studied. The x-ray refraction spectra show an induced photochromic effect. The content of Fe2+ increased with x-ray irradn., with a corresponding decrease of Fe3+.

CC 75-3 (Crystallography and Liquid Crystals)
Section cross-reference(s): 73

ST x ray scattering **doped** lithium niobate; iron **doped** lithium niobate x ray; magnesium **doped** lithium niobate x ray

IT X-ray, chemical and physical effects
(birefringence change induced by, in lithium niobate, effect of magnesium and iron **doping** on)

IT Birefringence
(x-ray induced changes in, of iron- and magnesium-**doped** lithium niobate)

IT 12031-63-9
(ESR and x-ray refraction in iron- and magnesium-**doped**)

IT 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties

(ESR and x-ray refraction of lithium niobate **doped**
with)

L65 ANSWER 9 OF 9 HCA COPYRIGHT 2003 ACS on STN
109:240091 Effective laser frequency conversion utilizing nonphotorefractive lithium niobate. Volk, T. R.; Rubinina, N. M.; Kholodnykh, A. I. (Mosk. Gos. Univ., Moscow, USSR). Kvantovaya Elektronika (Moscow), 15(9), 1705-6 (Russian) 1988. CODEN: KVEKA3. ISSN: 0368-7147.

AB Systematic studies of nonlinear-optical and photorefractive properties of LiNbO3:Mg, **LiNbO3**:Fe, **LiNbO3**: **Mg,Fe** and **LiNbO3**:Mg,Nd crystals grown from congruent melts were performed in the wide range of **dopant** concns. Nonlinear-optical characteristics depend nonmonotonically on the concn. and photorefraction is drastically suppressed at the wt. concn. of the Mg **dopant** >1%. The YAG:Nd3+ laser second harmonic generation was demonstrated at room temp. with the conversion efficiency of 25% utilizing crystals which contain 2.6% of Mg.

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT 12031-63-9, Lithium niobate (LiNbO3)
(laser frequency conversion using nonphoto refractive **doped**)

IT 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties 7440-00-8, Neodymium, properties
(laser frequency conversion using nonphotorefractive lithium niobate **doped** with)

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L66 ANSWER 1 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Fabrication of alumina-zirconia glass-ceramic abrasive particles with other oxides as separate crystalline phases

L66 ANSWER 2 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Alumina-zirconia-based glass-ceramics with high hardness for use as abrasives

L66 ANSWER 3 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Laser marking method and apparatus

L66 ANSWER 4 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Manufacture and use of negative thermal expansion ceramics

L66 ANSWER 5 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Laser marking method and material

L66 ANSWER 6 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Composition and preparing process for low-temp. sintered relaxation ferroelectric ceramic material in lead system

L66 ANSWER 7 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Alkylation method for preparing alkylcyclopentadiene derivatives

L66 ANSWER 8 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Ceramic compositions fusible at a low temperature and a flux for producing them

L66 ANSWER 9 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI High-dielectric constant porcelain

L66 ANSWER 10 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI A study on formation and sintering of lithium niobate

L66 ANSWER 11 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Oxygen stoichiometry of common reagents by fast-neutron activation

L66 ANSWER 12 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Photoelectron spectra induced by x-rays of above 600 nonmetallic compounds containing 77 elements

L66 ANSWER 13 OF 13 HCA COPYRIGHT 2003 ACS on STN
TI Action of difluorodichloromethane on metal oxides

=> d l66 10 cbib abs hitstr hitind

L66 ANSWER 10 OF 13 HCA COPYRIGHT 2003 ACS on STN
90:214386 A study on formation and sintering of lithium niobate. Shimada, S.; Kodaira, K.; Matsushita, T. (Fac. Technol., Hokkaido Univ., Sapporo, Japan). Hokkaido Daigaku Kogakubu Kenkyu Hokoku (91), 95-102 (Japanese) 1978. CODEN: HDKKAA. ISSN: 0385-602X.

AB For the synthesis of LiNbO3, equimol. mixts. of **Li2CO3** and **Nb2O5** were stepwise heat-treated at 20-900.degree., and the formation and sintering processes were studied by thermogravimetric, dilatometric and x-ray diffraction analyses and/or scanning electron-microscopic observations. The reaction of **Li2CO3** with **Nb2O5** proceeds at 300-700.degree., being accompanied by evolution of CO2. Diffusion of Li2O takes place through LiNbO3 layers in the form of a rate process. At 600-800.degree. small amts. of LiNb3O8 and/or Li3NbO4 are formed by reactions between LiNbO3 and **Nb2O5** or Li2O, resp. Single-phase LiNbO3 occurs at .apprx.850.degree., and homogeneous LiNbO3 powders can be obtained therefrom by treatment at 900.degree. for 2 h. The role of various oxides such as CdO, **ZnO**, CoO, **Fe2O3**, and GeO2 in the sintering of LiNbO3 powders was studied and discussed on the basis of Kingery's model, revealing that CdO is most effective. The presence of CdO seems to prevent the exaggerated grain growth which takes place in pure materials at 1050-1100.degree. and suppress the relative d. D. as high as 98% was successfully attained in this way through treatment at 1000.degree. for 2 h. The DTA data indicate that CdO and LiNbO3 react with each other at

750-895.degree. to give a second phase which is likely effective in hindering the undesirable grain growth.
IT **1309-37-1**, uses and miscellaneous **1314-13-2**, uses and miscellaneous
(sintering of lithium niobate contg.)
RN 1309-37-1 HCA
CN Iron oxide (Fe2O3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
RN 1314-13-2 HCA
CN Zinc oxide (ZnO) (9CI) (CA INDEX NAME)

O=Zn

CC 78-5 (Inorganic Chemicals and Reactions)
IT 1306-19-0, reactions 1307-96-6, uses and miscellaneous **1309-37-1**, uses and miscellaneous 1310-53-8, uses and miscellaneous **1314-13-2**, uses and miscellaneous
(sintering of lithium niobate contg.)

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L67 5 S L28 NOT (L54 OR L55 OR L63 OR L64 OR L65 OR L66)

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L67 ANSWER 1 OF 5 HCA COPYRIGHT 2003 ACS on STN
139:157022 Correlation of post-disposing effect on optical properties of MgFeMn:**LiNbO3** crystals. Zheng, Wei; Zhao, Liancheng; Xu, Yuheng (School of Material Science and Engineering, Harbin Institute of Technology, Harbin, 150001, Peop. Rep. China). Proceedings of SPIE-The International Society for Optical Engineering, 5060(Optical Storage), 187-190 (English) 2003. CODEN: PSISDG. ISSN: 0277-786X. Publisher: SPIE-The International Society for Optical Engineering.
AB The congruent tri-**doped** Mg:Mn:Fe:**LiNbO3** crystals were grown by Czochralski method in air atm. The crystal samples are reduced in Li2CO3 powder at 500.degree. for 24 h or oxidized for 10 h at 1100.degree. in Nb2O5 powder. Compared with as-grown Mg:Mn:Fe:**LiNbO3**, the absorption edge in UV-visible absorption spectrum of the oxidized sample or the reduced shifts to the red. The post-disposal, oxidn. or redn. disposing has no effect on O-H vibration absorption peak in IR region. In 2 coupling expts. the authors det. the writing time, max. diffraction efficiency and the erasure time of crystal samples in the same conditions. Oxidn. and redn. disposing has great effect on the holog. recording properties of these crystals. The reduced crystal exhibits the fastest response time 145s and the biggest diffraction efficiency 67% among the crystal series. The mechanism of post-disposing effect on the holog. recording properties of Mg:Mn:Fe:**LiNbO3**

crystals was studied.
IT 12031-63-9, Lithium niobium oxide (**LiNbO3**)
(correlation of post-disposing effect on optical properties of MgFeMnLiNbO3 crystals)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-11 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
ST correlation **iron magnesium** manganese lithium niobate
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(correlation of post-disposing effect on optical properties of MgFeMnLiNbO3 crystals)

L67 ANSWER 2 OF 5 HCA COPYRIGHT 2003 ACS on STN
134:92899 57Co Mossbauer emission study of **LiNbO3**, Fe: **LiNbO3** and Mg:**LiNbO3** in various thermochemical reduction states. Becze-Deak, T.; Bottyan, L.; Corradi, G.; Korecz, L.; Nagy, D. L.; Polgar, K.; Sayed, S.; Spiering, H. (KFKI Research Institute for Particle and Nuclear Physics, Budapest, H-1525/114, Hung.). Journal of Radioanalytical and Nuclear Chemistry, 246(1), 33-37 (English) 2000. CODEN: JRNCDM. ISSN: 0236-5731. Publisher: Kluwer Academic Publishers.
AB 57Co Mossbauer emission spectra of undoped and Fe or Mg melt-**doped LiNbO3** single crystals show substantial amts. of the nucleogenic Fe3+ charge state (*Fe3+) which was generated as an after-effect of the electron-capture of 57Co2+. The proportion of *Fe3+ is markedly dependent on the Mg content and on the stoichiometry of the sample. Electron trapping is described within the model of competing acceptors. The capabilities of the model are studied in defect structure anal. and charge trapping studies of **LiNbO3**.
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(cobalt-57 Mossbauer emission study of undoped, and iron- and magnesium-**doped** lithium niobate in various thermochem. redn. states in relation to electron traps and defects)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 73-7 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75
ST cobalt Mossbauer emission lithium niobate **iron magnesium** thermochem redn; electron trap cobalt Mossbauer lithium niobate **iron magnesium** redn; defect cobalt Mossbauer lithium niobate **iron magnesium** redn
IT Crystal defects
Electron acceptors
Electron capture
Electron traps

Mossbauer effect
Reduction
Trapping
(cobalt-57 Mossbauer emission study of undoped, and iron- and magnesium-**doped** lithium niobate in various thermochem. redn. states in relation to electron traps and defects)
IT 7439-89-6, Iron, properties 7439-95-4, Magnesium, properties 13981-50-5, Cobalt-57, properties
(cobalt-57 Mossbauer emission study of undoped, and iron- and magnesium-**doped** lithium niobate in various thermochem. redn. states in relation to electron traps and defects)
IT **12031-63-9**, Lithium niobium oxide (**LiNbO3**)
(cobalt-57 Mossbauer emission study of undoped, and iron- and magnesium-**doped** lithium niobate in various thermochem. redn. states in relation to electron traps and defects)

L67 ANSWER 3 OF 5 HCA COPYRIGHT 2003 ACS on STN
123:242341 Crystalline environment of Fe3+ ions in highly Mg-**doped** **LiNbO3** crystal. Zheng, Wen-Chen (Dep. Material Science, Sichuan Univ., Chengdu, 610064, Peop. Rep. China). Radiation Effects and Defects in Solids, 133(4), 329-33 (English) 1995. CODEN: REDSEI. ISSN: 1042-0150. Publisher: Gordon & Breach.
AB The substitutions of Fe3+(I) and Fe3+(II) for both Li+ and Nb5+ ions in **LiNbO3** crystal were studied using the superposition model. A displacement of the impurity ion along the c-axis is required to reach a good fit between the calcd. and obsd. zero-field splittings b20. By analyzing the displacement direction from the impurity displacement scheme suggested Fe3+(I) replaces Li+ ion.
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(cryst. environment of Fe3+ ions in highly Mg-**doped** **LiNbO3** crystal)
RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 75-3 (Crystallography and Liquid Crystals)
ST cryst environment **iron magnesium** lithium niobate
IT 7439-95-4, Magnesium, uses
(cryst. environment of Fe3+ ions in highly Mg-**doped** **LiNbO3** crystal)
IT 20074-52-6, Iron(3+), occurrence
(cryst. environment of Fe3+ ions in highly Mg-**doped** **LiNbO3** crystal)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(cryst. environment of Fe3+ ions in highly Mg-**doped** **LiNbO3** crystal)

L67 ANSWER 4 OF 5 HCA COPYRIGHT 2003 ACS on STN
112:207385 Nonphotorefractive magnesium-**doped** lithium niobate as the effective material for the nonlinear optics. Volk, T. R.; Ivanov, M. A.; Rubinina, N. M.; Kholodnykh, A. I.; Metz, H. (Inst. Crystallogr., Moscow, USSR). Ferroelectrics, 95, 121-5 (English) 1989. CODEN: FEROA8. ISSN: 0015-0193.

AB The comparative study of optical properties of Mg-**doped** and Mg-nondoped **LiNbO3**, and Fe-**doped** **LiNbO3** crystals was carried out. In all the crystals **doped** with Mg .gtoreq.1 wt.% the value of photorefraction decreased .gtoreq.102 in spite of Fe incorporation .ltoreq.0.1 wt.%. At room temp. the nonlinear optical elements of **LiNbO3**:2.4 wt% Mg revealed the conversion efficiency of 2nd-harmonic generation >25% with phase matching angle of 90.degree.. X-ray and UV-induced changes of the optical absorption revealed the alteration of the electron acceptor type in Mg-**doped** crystals. On the contrary to pure **LiNbO3**, in **LiNbO3** **doped** by Mg the Fe3+ is not more the electron acceptor center, what is followed by the change of the photoelec. and consequently photorefractive properties. Mg incorporation affects the ESR of Fe3+ in **LiNbO3**.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical nonlinear property of plain and magnesium- and iron-**doped**)

RN 12031-63-9 HCA

CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)

*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
Section cross-reference(s): 75

ST lithium niobate **iron** **magnesium** nonlinear

IT Optical nonlinear property
(of lithium niobate plain and magnesium- and iron-**doped**
)

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(optical nonlinear property of plain and magnesium- and iron-**doped**)

L67 ANSWER 5 OF 5 HCA COPYRIGHT 2003 ACS on STN

109:102951 Influence of magnesium **doping** and composition on the light-induced charge transport in lithium niobate (**LiNbO3**). Sommerfeldt, R.; Holtmann, L.; Kraetzig, E.; Grabmaier, B. C. (Fachbereich Phys., Univ. Osnabrueck, Osnabrueck, D-4500, Fed. Rep. Ger.). Physica Status Solidi A: Applied Research, 106(1), 89-98 (English) 1988. CODEN: PSSABA. ISSN: 0031-8965.

AB Light-induced charge transport properties of **LiNbO3** crystals contg. Mg **dopants** as well as Fe ions in different valence states were studied to obtain quant. information on the influence of Mg. **LiNbO3**:Fe crystals were studied with different Li/Nb ratios. The photovoltaic effect is detd. by the Fe2+ concn. only and depends very weakly on the Li/Nb ratio or Mg **doping**. The photocond., however, is considerably increased by Mg **dopants**, thus diminishing the light-induced refractive index changes.

IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(photocond. and photovoltaic effect of magnesium- and iron-**doped**)

RN 12031-63-9 HCA
CN Lithium niobium oxide (LiNbO3) (8CI, 9CI) (CA INDEX NAME)
*** STRUCTURE DIAGRAM IS NOT AVAILABLE ***
CC 76-5 (Electric Phenomena)
Section cross-reference(s): 73
ST photovoltage lithium niobate **magnesium iron**;
photocond lithium niobate **magnesium iron**;
refraction lithium niobate **magnesium iron**
IT Photoconductivity and Photoconduction
Photovoltaic effect
(of lithium niobate **doped** with iron and magnesium)
IT 7439-95-4, Magnesium, properties
(photocond. and photovoltaic effect of iron-**doped**
lithium niobate contg.)
IT **12031-63-9**, Lithium niobate (**LiNbO3**)
(photocond. and photovoltaic effect of magnesium- and iron-
doped)
IT 7439-89-6, Iron, properties
(photovoltaic effect and photocond. of lithium niobate
doped with magnesium and)